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Shop From Your Pocket:
Designing for Better
Mobile Shopping
Experience

Master thesis

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November 2014



Abstract

This thesis is concerned with development of efficient mobile applications for shopping “on the go” and takes a user-centered perspective, focusing on providing good customer experience. A case of an established wholesaler (providing traditionally business-to-business products and services, and in the process of switching to business-to-customer) is used to illustrate our user-centered approach to design of the mobile shopping application. A high-fidelity prototype of the app is developed with user participation and presented as the practical contribution of this work.

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Preface

I would like to take this opportunity to thank my supervisor Alma Leora Culén. Without her instruction and insightful comments, this project would not have been possible.

I would further like to show my sincere appreciation to the Original Source Company, whose cooperation helped me make such a great progress on this thesis.

Special thanks goes to my beloved Geoffrey Clark Carroll.

I would also like to thank all my friends in Norway and worldwide who gave me their support. These pure friendships make me feel warm.

Finally, I would like to thank my family members, especially my parents. Without your support and love, I may not have gone this far.

Chapter 1

Introduction

The incredible success of Amazon.com in the West, and Alibaba.com in the East highlights the growing importance of e-commerce to both the consumer retail and the wholesale industry. Online e-commerce webpages offer virtually every product or service a consumer in the modern society could need. However, recent evolution of technology is changing how we shop. The use of mobile phone apps, which allow for a quick, convenient and easy shopping experience while the customer is “on-the-go” (away from home or desk), are growing in popularity and changing traditional e-commerce practices and habits. While there is no reason to think that mobile phone apps will replace traditional online web-based shopping, their growth and importance do reflect changing consumer behavior. Purchasing through a mobile phone reflects a movement by consumers to use fragmented time frames to quickly make buying decisions. The impact on retailers and wholesalers is very significant and will change how they approach their e-commerce strategy. They must create e-commerce platforms that are better able to facilitate and complete a buying decision that is made in a small fragment of time often when the consumers are away from their familiar and comfortable home computer. No longer can providers of e-commerce products and services assume that their customer is sitting in an established, comfortable home or work environment, offering a big block of time to a website. Clearly, the growing popularity of mobile shopping apps reveal that customers are both ready and capable of making buying decisions on smart phones – often in a mobile state (sitting on a train, having coffee at a café, relaxing on a beach). As such, mobile phone apps must be super-efficient, intuitive and very easy to use. The app must perform in a very short period of time.

Mobile e-commerce is actually a complex research area. This thesis is concerned with development of efficient mobile applications for shopping “on the go” and takes a user-centered perspective, focusing on providing good customer experience. A case of an established wholesaler, the Original Source, who provides traditionally business-to-business (B2B) products and services, but is switching to business-to-customer (B2C) business model, is used to illustrate our user-centered approach to design of the mobile shopping application. A high-fidelity prototype of the app is developed with user participation and presented as the practical contribution of this work. During the design process, we were both inspired by the user and educated by the user. User input is analyzed and we conclude that the prototype, with further development, may become a shopping up, giving a very positive user experience.

1.1 Research Questions

This thesis is of a rather practical kind, with hands-on design, using user-centered approach. User participation in all the workshops has been fundamental in developing the prototype, as well as researching the effect of the prototype on user experience with shopping from the smart phone.

The research focus of this thesis may be summarized in a single research question, with three sub questions:

The research question

How can the user experience be strengthened in mobile e-commerce application design?

This question is answered in three stages, corresponding to the following sub questions:

1. Which user-centered design tools & methods are most suitable for development of a mobile e-commerce app?
2. Demonstrate, by making a high fidelity prototype, the use of chosen tools and methods and how users' were engaged in the design process. Reflect on all stages of the design process, including evaluation.
3. What is the user experience with this prototype? Does shopping feel faster, better, easy to use, useful, more secure than using the web or similar apps?

1.2 Personal Motivation

Before I came to Norway, I was a college student in Beijing, China. For my first entrepreneurship, I had a little shop on Taobao.com – a subsidiary company of alibaba.com. We developed the “Happy Egg Family” - a group of cartoon avatars, which we then printed on T-shirt, mugs, pins and mouse pads. The sales on Taobao.com were not that good even though those cartoon avatars were popular among college students. One of the problems was that instead of designing my own webpage interface, we had to rely on the default templates provided by Taobao.com. These templates were neither attractive nor convenient. But, this entrepreneurship experience made me intensely interested in e-commerce and open the door for my desire to build my own business.

When I had an opportunity to start my master's program for Human Computer Interaction at University of Oslo, most of my class projects were related to mobile application design. At the same time, the iPhone became increasingly popular each year. With more experience gained in my class, I came up with a “dream” idea – Can I sell products through a mobile phone utilizing easy interaction AND resulting in better overall sales? For my thesis, rather than working with my own business, I chose an

American wholesale company named Original Source to use as a design case. The company was interested in creating an iPhone app for e-commerce. Previously, they had only web application for both B2B and B2C business models. This time, with both my previous web e-commerce experience and my knowledge gained through all the class projects, I realized that it would be an ideal time to combine my “dream” with my interactional design skill. I was going to design an iPhone application for the Original Source for retail sale business. And I could use my research skills to choose the best methods, to evaluate prototypes well and to test the user experience with the app. On top of it all, this becomes my master thesis!

1.3 Structure of the thesis

Chapter 1 A brief introduction to the thesis and comments on E-commerce.

Comparative comments on the superiority of mobile application versus web application and background information on the iPhone app project.

Chapter 2 Research review and paradigms. Give an overview about Human Computer Interaction, user experience, mobility, interactional design, and e-commerce.

Chapter 3 Present relevant research methods for gathering data, design and evaluation. Are subjects draw upon the academic theory which supports the design of this project.

Chapter 4 A description about **the** predesign process, talking about the user requirement gathered, including case study and questionnaire.

Chapter 5 A description about design process, including future workshop, perspective workshop and semi-interview.

Chapter 6 A description about low-fi prototype and high-fi prototype, finalized with an iPhone application demo.

Chapter 7 Usability testing, test the app demo.

Chapter 8 Draw a conclusion, summarize the finding and give **suggestions** for future work.

Chapter 2

Literature Review

This chapter presents literature that was reviewed in preparation for the thesis work. This thesis is within the field of HCI, more specifically within design of mobile applications. User-centered design was used as the main approach, with focus on user participation in the design process. In design of the iPhone application, we emphasized the mobile interface design. We believe this was an important design consideration since a mobile phone offers a much smaller screen than a laptop. User experience, with its focus on positive experience and trust, is also a relevant topic. The growing role of online shopping applications in e-commerce was also explored in the literature. Research fields relevant to this study, and explored in this section, are shown in the Figure 1.

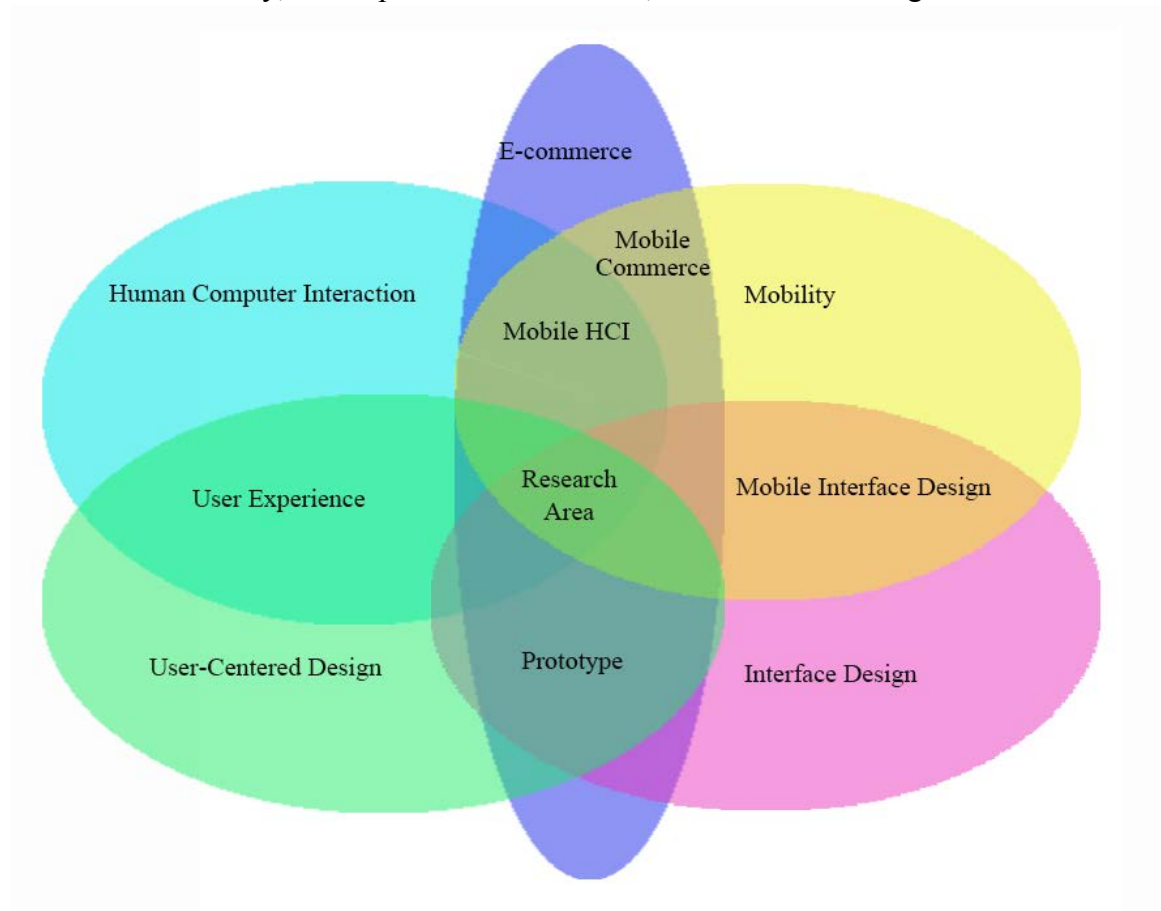


Figure 1: Research Area

2.1 Human Computer Interaction

Human-computer interaction is a relatively recent field. It first became known in the 1980s, and focused primarily on the impact of human factors on computer design. But, over the years, interest in this research area has grown and now goes beyond just the human and cognitive influences to include many other fields of computer science: “the original academic home for HCI was computer science, and its original focus was on personal productivity applications, mainly text editing and spreadsheets” (Carroll, 2006) . Today, HCI has grown to be a broader and larger field, including much more than just a desktop applications, it includes also interaction with games and handheld devices.

Research on Mobile HCI centers on the interaction with personal mobile devices, largely specifically on smart phones. Key issues of focus include the impact of utilizing a small screen. Research addresses how to make these small screens more effective – how to make them more intuitive – how to make them easy to navigate (Wobbrock, 2006). And lately also, on creating positive user experiences, designing cool things (Culén and Gasparini, 2012; Holtzblatt, 2011).

2.2 User-centered Design

User-centered design is a process that focuses on the user. The creative process used to design an interface is conducted from the perspective of a user – not a technician or designer. It focuses on users through the whole process of planning, design, and development of a product(W3C, 2004)

A user-centered design process provide “a valuable framework for developing products that people will enjoy and want to use “(Lalji and Good, 2008)\all the needs, demands and desired should be met during the product development process.

The user can be considered as the stakeholders of the project. Rintoul in (Rintoul, 2014) present that there is an effort to engage the stakeholder (the user) during development. By focusing more on the stakeholder, the process of design development benefits in several areas. The users become supporters of the interface and design. They become enablers. Users become more committed to the final design if they are engaged in the development process. They appreciate and understand that the process is conducted to increase long-term sales.

2.3 User Interface Design

An effective interface must offer a user a simple, intuitive and efficient approach for accomplishing tasks. A user should be able to navigate through an interface smoothly without confusion, interruption and without getting lost.

An interface should be intuitive. One of the key focuses of interactional design is the idea that interface actions should be both natural and intuitive. To achieve this, designers need to introduce elements that make the completion of a task easy and effective (Lumsden and Global, 2008). One of the challenges of User Interface design with mobile devices is the very limited space. This creates an obvious challenge for the designer. There is a need to focus not only on the design elements but also the environment in which these elements will be engaged. (Rinott, 2004)

According to the perspective of Affairs (Affairs, 2013), the consistence and predictability of interface elements are very important. User becomes familiar with similar elements during the process of using, so the design adopt those elements will be helpful to finish task completely, efficiently and satisfied. Affairs says:

“Interface elements include but are not limited to:

1. **Input Controls:** checkboxes, radio buttons, dropdown lists, list boxes, buttons, toggles, text fields, date field
2. **Navigational Components:** breadcrumb, slider, search field, pagination, slider, tags, icons
3. **Informational Components:** tooltips, icons, progress bar, notifications, message boxes, modal windows
4. **Containers:** accordion”

(Affairs, 2013)

One of the best methods to communicate designs for an interface is through the use of simple sketches. Sketches are incredibly effective in quickly revealing how a design wants to approach the development of an interface. One of the most important concepts is that interface design should be guided by focusing on a user’s perspective and not the perspective of the designer. It is a user-centric design approach. (Wong et al., 2012) “it is important that the interface designers give thoughts on the overall hierarchical menus, icons design, and its screen and display layout arrangement based on the user’s mental mode (Norman, 1983) rather than designer’s mental model” (McDaniel, 2003)

2.4 Mobility

Mobile Computing is "taking a computer and all necessary files and software out into the field. Mobile computing is any type of computing which use Internet or intranet and respective communications links, as WAN, LAN, WLAN etc. " ("Mobile computing," 2014).

There are at least three different classes of mobile computing items: portable computers, mobile phones and wearable computers.

The existence of these classes is expected to be long lasting, and complementary in personal usage, none replacing one the other in all features of convenience..

When describing the environment and setting of mobile users, you have to consider three areas: "spatiality, temporality, and contextuality." (Kakihara and Sorensen, 2002)

Spatiality refers to the free movement of mobile users or their ability to engage the mobile device at almost any location. Temporality refers to the sense of immediate access to the Internet. Regardless of what the user may be doing, generally access to the Internet is constant and immediate. Contextuality refers to a user's ability to interact and engage with other users (Lee and Benbasat, 2003).

Certain applications known as "context-aware application" rely on mobile features that identify location and adjacent resources (Schilit et al., 1994). An important consideration of m-commerce is to take into account that users will often only commit a small fragment of time to any task. (Pascoe et al., 2000)

2.5 User experience

Hassenzahl in (Hassenzahl, 2008) define UX as a momentary, primarily evaluative feeling (good-bad) while interacting with a product or service. The use of UX as a measurement tool introduces a human value into the evaluation. UX allows us to go beyond the nature of the product and its applications. UX instead attempts to convey a human sense of satisfaction and stimulation.

A user's experience with interactive technology can be described in different ways. One way refers to the practical value of the product – does it work. Does it achieve its goal in accomplishing a task. But, there is also another way of evaluating a product – and this refers to the feeling of the product. Is it special? Is it something of genuine value?

Hassenzahl in (Hassenzahl, 2005) assume that people perceive interactive products

along two different dimensions: “pragmatic quality” and “hedonic quality.” Pragmatic refers to the functional usefulness of the product while hedonic refers to the feelings of value associated with the product. It appears to be a question of objective and subjective evaluation.

“Good UX is the consequence of fulfilling the human needs for autonomy, competency, stimulation (self-oriented), relatedness, and popularity (others-oriented) through interacting with the product or service (ie, hedonic quality).”(Hassenzahl, 2008)

While it is critical that a product accomplishes its stated tasks in a very pragmatic and direct way – we must go beyond its pure functional value. Good design requires more than functionality. The idea is to offer a more enjoyable experience. One example is the idea of communicating with other users. In doing so, the feeling should be that of a relationship with another user – not simply communication for the sake of answering questions.

For most people, mobile phones have a huge impact and influence on their lives. As such, it makes sense that any design of applications and interfaces for mobile devices should begin with a clear focus on user experience. Because of the very personal role that mobile phones have in our lives – user experience must be the key consideration in any design activity. Cecil in (Cecil, 2006) presents that “we can do this by following a user-centered design process to

- understand the contexts within which our customers use these devices
- select the technologies that best integrate into these contexts
- design systems that are as simple as possible”

A key element of the user design process in regards to mobile apps is to grasp and recognize the incredible importance of a smart phone in our lives. There are strengths and challenges related to mobile app design. Certain processes work – certain do not. All must be taken into consideration. One way to accomplish this is to engage in user observation and research. In doing so, we must pay attention to understanding where and when users will use our services. Will the app be used at work – on the beach – or in the comfort of the user’s home? Understanding when and where a user will interact with the product or service is a major consideration in the design process.

Other features of user design require that we also take into consideration the anticipated time of use – culture of use – and environment of use. All of these questions impact design. Is it a service or product that a mother might use in the early morning – is it a product or service that might be used while working-out in a gym – or is it a product or

service that might be used while traveling in Europe? Effective user-design takes all of this into consideration.

2.6 E-commerce and e-commerce on mobile devices

Vanhoose in (VanHoose, 2011) definite that “Electronic commerce(e-commerce) refers to any process that entails exchanging ownership of or rights to use goods and service via electronically linked device that communicate interactively with networks”

Moreover, there is an evolving definition of E-commerce. In the past, E-commerce focused on the selling of goods and services online. Product was sold through websites. However, today when the phrase E-commerce is used, it refers to many other areas of business activity. E-commerce now also describes multiple business functions such email, conferencing, product sourcing, file transfer and more.

E-commerce exists at both the individual level and at a strategic business level. (Goy et al., 2007)

- *Business to Business e-commerce (B2B)* concerns the management of business interactions between enterprises.

- *Business to Consumer e-commerce (B2C)* deals with the interactions between enterprise and end customers.

M-commerce applications refers to a applications that embrace mobility and an extended reach. Specifically, by mobility, we are referring to mobile devices. M-commerce describes the ability to engage in business at any time. It implies the ability to reach the user constantly. There is no separation between user and the ability to conduct online purchasing. (Ngai and Gunasekaran, 2007)

“M-commerce is a technological frontier and is an attractive area for research because of its relative novelty, rapid growth, and potential applications” (Sadeh, 2003)

2.7 Mobile app development

A description of the mobile app development process is shown as below. It starts with a Plan and ends with Implementation. After Design process, a Prototype is developed for evaluation. The problems and challenge will be discussed and analyzed to support the next step design process. It can be cycled many times until a finally application is implemented.

As below is the interaction design lifecycle model provided by Sharp(Sharp et al., 2007)

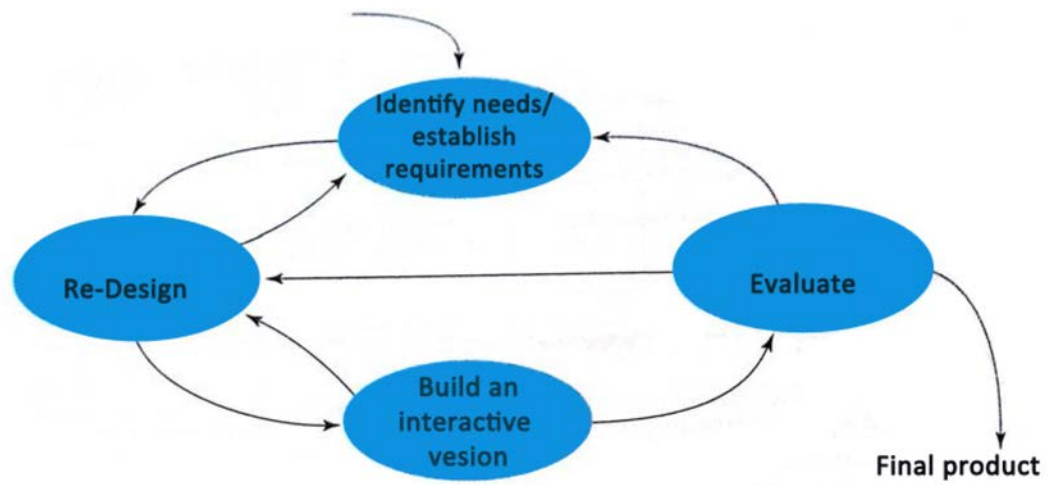


Figure 2: A Simple Interaction Design Lifecycle Model

Chapter 3

Methods

3.1 Data gathering methods

3.1.1 Case study

A case study analysis is a method by which an event can be studied within an established framework of theory. With each case study, there are guidelines to follow in terms of data collection and data analysis. (Yin, 2002)

Lazar in (Lazar et al., 2010, p.147) presents four key aspects of design can be used to describe case studies: “

1. In-depth investigation of a small number of cases;
2. Examination in context;
3. Multiple data sources;
4. Emphasis on qualitative data and analysis”

According to the research question, along with budget, time limitation, and ethics problems, only one method meets our requirements and constraints, which is case study.

Introduction

Before we start to design an app, we need to have a basic understanding of online mobile shopping (retail) apps in the market, and gather valid data for research. Implementing a case study, even a small one as is done in this thesis, is one of the best ways to gather research data.

Goals

Lazar in (Lazar et al., 2010, p.149) presented that broadly speaking, HCI case studies have four goals:“

1. *Exploration: understanding novel problems or situation, often with the hopes of informing new design.*
2. *Explanation: developing models that can be used to understand a context of technology use.*
3. *Description: documenting a system, a context of technology use, or the process that led to a proposed design.*
4. *Demonstration: showing how a new tool was successfully used.”*

For our project, we need to know what are the commonly used e-commerce smart phone applications in the consumer retail market? What functions do they have? How is the user experience? Are there any difficulties when the users are using them?

Multiple cases

Even though this case study does not require a big group of participants, it is not limited to single cases. Two and two more cases can be very helpful to better understand the user behavior during the observation. Lazar in (Lazar et al., 2010, p.157) argues that “one of the important goals of many case studies is generalization.” Two and two more cases can broadly gather more data and compare differences between different participants during the experiment.

“This use of closely comparable cases to demonstrate consistency of results is known as Literal Replication” (Lazar et al., 2010, p.157) . For our study, literal replication approach is applied using two participants and two commonly used retail mobile apps. If the observation and insights gained from the two cases were similar, we might be more inclined to believe that these results were applicable to users in general.

Technology Triangulation

Lazar (Lazar et al., 2010) addressed that “Case studies often rely upon multiple data collection techniques to act as sources of corroborating evidence. More data can increase the confidence of researchers during observation.”

Triangulation is broadly defined by Denzin (Denzin, 1978, p.291) as "the combination of methodologies in the study of the same phenomenon." We are using 2 methods in this case study: observation and interview

Components of a Case Study Design (Lazar et al., 2010, p.161): “

- 1) *Questions - What are you interested in understanding?*
- 2) *Hypotheses or propositions - Statements of what you expect to find*
- 3) *Units of analysis - Granularity of what you expect to focus on*
- 4) *Data analysis plan - How will you interpret data?”*

For this project, we need to know how well mobile e-commerce apps in the market work when customers use them to shop using their smart phones. We need to study a small number of participants in order to gather requirements and evaluate interfaces. For our case study, the observational research method selected should not require too much interfering when we use it.

3.1.2 Questionnaire

We selected the questionnaire as a research tool for the purpose of gathering a basic understanding of the customers' preferences, buying behavior and overall opinion of the Website. As a research tool, a questionnaire is one of the most popular. It is relatively easy to administer which makes it particularly well-suited for research involving large groups of people. (Babbie, 1990). As a research tool, questionnaires have many advantages – that include:

One key advantages of a questionnaire is its obvious ability to collect an enormous amount of information in a cost effective manner. There is a tremendous savings in research time and money when a questionnaire can be distributed across a large group.

A questionnaire can be utilized to carry out a large-scale survey. And the larger the surveyed population, the more accuracy that is injected into the study itself. Regardless of the number of researchers involved in the survey, the questionnaire lends itself to objectivity in information gathering. i.e., you can understand the basic attitudes and behaviors of the respondents derived from the questionnaire format of investigation. This approach cannot be replaced by any other investigative tools. Also, the impact questionnaire survey can self-cycle without big changes, researchers can track their problem changes through some of the user issues.

It is undeniable that a few drawbacks of questionnaire exist when the survey is administered to users, especially to use it as a research method:

It is easy to conduct wide broadside research from many users, but it is hard to go deeply into certain questions making it difficult to discern the finer details from the respondents. So, we will need an interactive method such as a future workshop. This would involve interviewing willing surveyed participants as a primary follow-up technique in order to lend overall credence to the study.

Doing a survey questionnaire depends on users' time, mood and even the potential respondent's environment. Users will be more focused on the questions if they are filling out the form by computer in an office setting rather than by using a mobile phone in restaurant while waiting for their meal to arrive from the kitchen.

In order to answer some of the questions, the respondents need to recall from memory and make a reasonable evaluation relevant to the question. As memory is a subjective thing, error may be introduced into the response; memory isn't totally to be trusted. Another weakness is this: when people begin to answer their questionnaire while not in the best of moods, the result may be negatively skewed by this factor alone.

In this thesis, a questionnaire has been an important tool for initial understanding of users preferences related to ecommerce. We created an online questionnaire that was sent to 3000 users. We received 30 responses with one week. The analysis of these responses is presented later in this thesis.

Choose a good approach

There are two ways to do a questionnaire. There is the time honored paper version and the more modern method of electronically transmitting an online questionnaire link. We will choose the modern online survey for this research for these three reasons:

First of all, using the online questionnaire as a tool makes it is easier to get feedback from users who are from different countries and regions. For the older style paper questionnaire, we need to meet users face to face and let them fill the questionnaire manually by pen; this time consuming method increases the difficulties when we wish to “transcribe” our questionnaire

The online survey takes little time to get feedback. People can fill in a questionnaire anywhere and anytime. It’s an easy thing to fill out a questionnaire using either a laptop PC or equally easy using one’s smartphone. For example, when waiting for bus on a bus station, it is actually a quite enjoyable way to pass otherwise idle time by filling out a questionnaire. This might take as little as five minutes of a respondent’s waiting time. A questionnaire usually involves some more sensitive questions. When using the paper questionnaire, sometimes people feel hesitant or shy when they answer questions of this nature. They may feel that they’re under watch, so to speak, as an investigator will usually be face to face with the subject of the questions. They, might choose an answer which looks better instead of choosing the more accurate and honest one. So, when the questions are of this more sensitive nature, it is easier to get honest answers by utilizing the online questionnaire.

3.2 Design methods

3.2.1 Workshop

Workshop is “a method of involving people who are directly affected by a technology or a technological problem”(Teknologi-Rådet., 2014)

Specifically, A workshop has been defined as:

“ . . . A usually brief, intensive educational program for a relatively small group

of people in a given field that emphasizes participation in problem solving efforts.. .” (Webster, 1977)

Most workshops have several features in common:

1. *Workshops are comprised of small number of participants – on average about 5 to 15 people.*
2. *An effective workshop will often be comprised of participants who are working together or at least are working within the same type of industry or profession.*
3. *The individuals who are managing the workshop possess experience and background in the material to be analyzed.*

(Community Tool Box, 2014)

Future workshop

Vidal in (Vidal, 2006, p.2) proposes that “Future Workshop (FW) emphasizes: critique, learning, team work, democracy and empowerment.”, it is truly an egalitarian approach.

The future workshop is a technique developed by Robert Jungk, an Austrian writer and journalist who has extensive experience in organizing group meeting for citizen in the 1970s. Vidal in (Vidal, 2006, p.2) present the original idea is “that a group of people should cooperate to create ideas and strategies for future” , that is also where the name originates from. For the past 40 years, it has been used in many different situations. Its development has taken place in the “real world” and has not simply been confined to an academic environment. From the social development of communities to its use in the design of new systems and process, it has been used extensively.

A future workshop is specifically designed to encourage creative expression among a designated group that shares a similar goal or requirement (Vidal, 2006). The entire process is based on a democratic and egalitarian exchange of ideas – where participants begin with candid unfiltered critique and then move toward the expression of fantasy (“utopian”) solutions. The purpose of the democratic approach is to encourage creativity and open / rapid expression among the group. One of the guiding principles of FW is to establish a sense of equal empowerment among all participants.

A new relationship is emerging between consumer and retailer. This new relationship is far more democratic in nature – characterized by much greater transparency and a very open flow of information regarding product pricing and availability. This new relationship does create considerable challenges for the retailers as they learn to interact with consumers who are digitally-empowered and possessing much more information on

comparative pricing. The purchasing behavior from an online shopping website provides a tremendous mutual learning opportunity between retailers and consumers.

Mobile application of online shopping has an enormous amount of users. Researching the how users engage and employ online shopping websites and applications requires the use of group behavior research tools. As such, a group behavior research tool such as a Future Workshop is both appropriate and effective.

Initially, online shopping might be regarded as a very independent and individualized behavior – after all, most online shopping is likely done alone sitting in a room. But while the actual process of shopping is done individually, group dynamics are involved. First, because of global access, online shopping has a potential target market that includes a huge number of potential customers – a very large group. Moreover, like any other traditional shopping method, purchasing decisions of one person can easily influence purchasing decisions of another person. For example, just as a traditional brick & mortar retailer can create a surge of enthusiasm for trendy products and influence consumer demand – so can a website or mobile application.

In conclusion, the use of a group study method – such as Future Workshop – is very effective and appropriate when the research is focused on group behavior.

We have incorporated the use of future workshop as a tool for the development of a mobile application for online shopping for Original Source. To address this issue, future workshop was used to evaluate the current eCommerce tool (the OriginalSource Website) and then lead the discussion to the development of a mobile application.

For Original Source projects, it is good to see we have great progress on design process after Future Workshop. We need a research tools which can be conducted in a short time with small amount of participants. User-centered design requires people's group work, a workshop can create a sense of community among the participants.

Clearly, all of our participants are impacted by the technology and resources provided by Original Source. All are current customers of Original Source – all rely on technology and smart phones to simplify their life and all have demonstrated an eagerness to shift from an Original Source website to an Original Source mobile app. Our group is indeed directly affected by a current technological problem which is how to create an Original Source mobile app that offers distinct advantages compared to the Original Source website. Our workshop was conducted to help determine the best design for the Original Source mobile app.

Perspective workshop

The primary advantage of a perspective workshop is in the totality and completeness of technological evaluation (Teknologi-Rådet., 2014) A technological process or challenge is evaluated in terms of its potential, its weaknesses and problems. Moreover, ideas, speculation and myths associated with the technology are discussed. This workshop offers an ideal environment to candidly address all aspects of a specific technology.

Why did we determine this particular workshop was suitable to address the development of the Original Source mobile app? In addition to its heavy focus on evaluating all sides of a given technology, the format of the workshop encourages the creation of multiple idea lists which are displayed prominently for all to see. The process by which an app is designed is characterized by dozens of comments and ideas each applying to one of the multiple pages or processes of the app. We need a format that allowed us to capture and immediately share all these ideas at once. A Perspective Workshop is an ideal format for active brainstorming and evaluation of a high number of comments.(Teknologi-Rådet., 2014) Moreover, this type of workshop depends very heavily on the unique background and experience of its participants. With this workshop, diversity in experience is an asset as it will result in a greater variety in both perspective and opinions. In the end, the participants must find a way to make sure that their very different perspectives result in an agreed upon action plan.

It include 4 steps:

1. Present situation
2. Consequences
3. The Future Scenario
4. Perspectives

It is very suitable for our design process, in order to make a high-fi prototype, we do need more perspectives from users.

3.2.2 Prototyping

Prototyping is the most vital and basic element of interactive design. A prototype is the key tool that encourages people to translate an idea from just a thought to something with actual shape, body and design.(Matt and Gary, 2006) Often, the entire design process begins with just a basic sketch. It is from this sketch, that a problem and a solution can be immediately visible and understood (Fallman, 2003).

The prototype is an initial representation of the design process. That representation can be in the form of a diagram, sketch, drawing or even a physical mock-up. But the value of prototyping comes from its ability to generate ideas, suggestions and changes to the original design. Specifically, a prototype is created to be critiqued and subsequently

improved. The success of a prototype is related to the “cycles of critique” (Matt and Gary, 2006) . Each cycle represents an effort to further improve a design. Prototypes are created to go through multiple cycles of critique – the more cycles, the more likely that the end design will serve its intended purpose.

Prototypes are an effective way for designers to present ideas in the very early stage of design process. It is understood that any great design must have gone through multiple revisions (cycles of critique) before settling on a final design. Another key benefit of the prototyping process is its ability to separate design from implementation. Far too often, design and implementation take place concurrently.

“When struck by a design idea, there is a tendency, among programmers at least, to code up the idea, developing the design in tandem with the code. Often this leads to premature commitment to a half-baked design idea” (Jones and Marsden, 2006, p. 172)

Prototyping gives the HCI designer an opportunity to concentrate and truly focus on features without rushing to code and implement. This separation allows for a much more thoughtful and thorough design process.

The difference between a low-fidelity and high-fidelity prototype can be attributed to its level of development. Prototypes are defined by “how closely they resemble the final artifact.” (Jones and Marsden, 2006, p. 170)

Low-fidelity prototypes are not as developed as high-fidelity and reflect the design process at a very early stage. As such, low-fidelity prototyping can often appear very rough – such as sketches or even post-it notes.

We realized that no matter how much we might be able to describe the design, the entire process was so much more intuitive when sketches were used. Jones and Marsden (Jones and Marsden, 2006, p. 171) point out “A common form of low-fidelity prototyping is sketching an interface.”. The best way to convey ideas is to draw it on paper or a computer.

In the words of Jenson (Jenson, 2002), prototyping is a way to ‘fail fast’, his rationale being that if we fail enough times, then eventually we will get it right. Fundamentally, a prototype is a communication tool – it is a low-cost and fast method by which a designer can present his or her ideas.

Generally, there are two forms of prototypes: low-fidelity and high-fidelity. For our project, we produced both prototypes. The low-fidelity prototype was the outcome of the

future workshop, incorporating the suggestions of our participants. Then, following the workshop, a high-fidelity prototype was produced.

3.3 Evaluation Methods

3.3.1 Interviews

In design process, after a prototype was developed, a good interview is a key tool to gain insight into a user's requirement, and will reveal their preferences and concerns. (Lazar et al., 2010)

An interview can provide a designer with valuable feedback. (Lazar et al., 2010)

There are three types of interviews that can be used:

- 1) Fully Structured Interview – This type of interview uses an established set of questions that are strictly adhered to.
- 2) Unstructured Interview – This is less strict and rigid and can rely on more general list of questions that serve as a guide.
- 3) Semi-structured Interview – This format allows for much more flexibility. The direction of the interview can vary based on feedback and a free-flow of comments and questions.

In this thesis, the interviews have been use in conjunction with the case study using structured interviews and in prototype evaluation, using semi-structures interviews.

3.3.2 Usability testing

A usability test is a method to improve the performance and function of interfaces on devices. It does this by asking users to attempt to conduct tasks on the interfaces. Observing how a user interacts with the interface will reveal areas of needed improvement (Lewis, 2006). A usability test is a tool to improving interfaces.

There are several options for usability testing – and they are grouped within three categories: 1) expert-based testing 2) automated testing and 3) user-based testing. Expert-based testing relies on the use of rigid inspections conducted by experts. The experts are divided between those who have expertise in interface design but not tasks and those who have expertise in conducting tasks, but not interface design. Automated testing relies on the use of software to evaluate strengths and weaknesses with interfaces. And, as its name implies, use-based testing relies on observing how actual users engage

and use the interface (Lazar et al., 2010). For our project, we implemented user-based testing.

There are also different types of usability-tests that are defined by the stage of development. At an early stage of development – such as when a low-fidelity prototype is being evaluated – formative testing would be used. As the prototype is developed further, then summative testing would be employed. And in the final stages of development, just before the interface is introduced, validation testing would take place. For our project, we implemented validation testing.

Therefore, after the interview, we took all of the important data, and made key changes. We developed an interface with object C and some coding. The result is that we created a demo in iOS Simulator iPhone 5s. This would be the key tool for our usability test.

3.3.3 User Experience evaluation

“User experience evaluation refers to a collection of methods, skills and tools utilized to uncover how a person perceives a system (product, service, non-commercial item, or a combination of them) before, during and after interacting with it. It is non-trivial to assess user experience since user experience is subjective, context-dependent and dynamic over time.” (Wikipedia, 2014)

In our project, the participants were showed both the webpage and application demo, and expressed their evaluation by filling a small questionnaire.

Chapter 4

Data Gathering Process

4.1 Case study

4.1.1 Preparation

We invited a couple who lives in San Jose, California as the participants of our case study. For the purpose of keeping their anonymity, we will call them “Mike” and “Helena”. Both of them have been using smart phones for around 3 years. Each currently uses iPhone 5S. They usually use their phones at work during breaks, after dinner, sitting at sofa, reading news or watching Youtube videos.

In order to simulate the same condition as their daily phone usage habits, they were asked to use their own phones, and to use their home for the study environment. Personal phone and home environment are familiar, so they would feel much more relaxed and comfortable than in a research lab using different mobile devices. Before beginning the case study, they have downloaded 2 apps onto their phones.

4.1.2 Participant Profiles

Participant 1: Mike

- Gender: Male
- Age: Mid-30's
- Home: San Jose, California USA
- Profession: Technology business professional
- Average time using smartphone apps each day: 2 hours
- Frequency of making mobile e-commerce purchases: 1-2 times per month
- Familiarity with the apps being used for the study: none

Participant 2: Helena

- Gender: Female
- Age: Mid-30's
- Home: San Jose, California USA
- Profession: Principal at high-end fashion startup
- Average time using smartphone apps each day: 3 hours
- Frequency of making mobile e-commerce purchases: 5-6 times per month
- Familiarity with the apps being used for the study: none

4.1.3 Application Selection

The participants used two of the latest Top 25 U.S. mobile e-commerce apps for the study, and apps they have not used before (mobile versions). Top 25 ratings are based on total number of application downloads during January-March 2014 (Siwicki, 2014) Below are the two applications used in the test:

1. Amazon
2. Victoria Secret

4.1.4 Process

1. Observation

We asked Helena and Mike to each observe the other. Mike used the mobile apps first.

Observations of Mike:

AMAZON

1. First three minutes Mike did general browsing and seemed relaxed.
2. As Mike focused on searching in “electronics” category, he began to become confused. He was trying to sort and filter deeper, but could not.
3. Mike then went back to general category selection and began searching books. For about 45 seconds Mike seemed fine, and after about 45 seconds Mike started to quietly swear. This lasted about one minute.

VICTORIA SECRET

4. For about first 2 minutes Mike was quiet and seemed okay using the app.
5. Mike began focusing on one category. After about one minute, he placed an item in shopping cart.
6. Mike began looking in different category. After about 1 minute Mike was looking upset. He started speaking to himself out loud:
“Oh, man! Really?”
“Oh, this is frustrating! I give up.”
7. Mike stopped shopping, and then proceeded to “checkout” just the one item.

Observations of Helena:

AMAZON

8. Helena did general site browsing for about 4 minutes.
9. Helena began looking around in “Beauty” section for about 2 minutes

10. She selected one item from “Beauty” section into the shopping cart
11. She then began doing random browsing. After about 2 minutes she stopped trying to randomly browse.
12. She began to search women’s clothing for about 2 minutes, but no purchases
13. Helena purchased the shopping cart item and then closed the app.

VICTORIA SECRET

14. Helena browsed the app site for about 5 minutes.
15. She then focused on three specific products, for about 5 minutes.
16. Helena did not end up purchasing anything from Victoria Secret.

2. Interview

Then we interviewed about Mike and Helena, with the same questions below:

1. Is it easy for you to use the two apps? If you were to rate your experience using the apps between 1 and 5, how would you rate them?

1 = Very easy, very fast, intuitive

2 = mostly easy, fast, fairly intuitive

3 = was okay. A little slow. Okay navigating around site

4 = a little frustrating; slow. and some troubles navigating site

5 = very frustrating, not a good experience

2. Where did you get stuck when you were using them?
3. What is (are) the hardest part(s) for you to use?

Mike Interview

Q 1: Is it easy for you to use the two apps? If you were to rate your experience using the apps between 1 and 5, how would you rate them?

Answer: “It was okay using them. Each seemed to have different good things, and different bad things. I liked how Amazon has the “Shop by Department” fixed at the top so it was easy to find. I also liked the promotions and customer reviews.”

I would rate Amazon a “3” and Victoria Secret a “5”

Q 2: Where did you get stuck when you were using them?

Answer: “For Amazon, I got stuck right away, after I did some general browsing. I was wanting to search with filters but I couldn’t until after I already was searching. That was kind of strange.

I also got stuck looking for books. I was looking for books to read for fun and as gifts but I was not able to filter or sort by price or by ratings.

For Victoria Secret, I got lost. When I scrolled down looking at specific items, I couldn’t find my shopping cart or the main menu or search feature.

I wish there was something like the floating button the Facebook messenger uses. No matter what screen you are on, you can always click on the FB messenger button, and you can move it around if it is blocking your view on the screen.”

Q 3: What is (are) the hardest part(s) for you to use?

Answer: “The hardest part was sorting and filtering. I really wish I had better way to narrow down my choices, like by price and ratings.”

Helena Interview

Q 1: Is it easy for you to use the two apps? If you were to rate your experience using the apps between 1 and 5, how would you rate them?

Answer: “I had an easy time using the apps when I knew specifically what I wanted to buy. But, if I was not certain what to buy, and when I wanted to buy several things, it wasn’t as easy.

I would rate Amazon a “4” and Victoria Secret a “4”

Q 2: Where did you get stuck when you were using them?

Answer: “I got stuck in two places. For both app’s, when I tried to browse looking for things, like gifts for my girlfriends, the ‘search’ key did not help me as well as I wanted. I tried to type in words to give me good buying ideas, but the search came back “empty” with no items found.

I also got stuck trying to search by size, color, and price. I couldn’t filter or sort by those things.

Another thing that frustrated me because I was losing my place shopping, was on Victoria Secret site; I was buying a few things, and I couldn’t double-check my shopping cart very fast, and then find my place back where I was shopping.”

Q 3: What is (are) the hardest part(s) for you to use?

Answer: “There were a couple things that were difficult about the 2 apps’ like I mentioned, but probably the thing that was the most difficult thing for me was that I could not easily narrow and organize my searches the way I wanted, especially Victoria Secret.”

3) Summary of Mike and Helena’s activities.

| Object/ Task | Description | Intentions/ Goals | Limitation (what exactly is going on?) | Explanation (why does limitation happen?) | Workaround (how is limitation overcome?) |
|--|--|---|---|---|--|
| Sorting/filtering | Uses many sorting features to narrow search and make purchase selections | Narrow selection easily to make best purchase. | Not able to easily sort and narrow options. | 2 of 4 sites not able to filter and sort by price (and range ⁴ | Allowed more time to search, and wrote down top several options |
| General navigation | Moves to different screens using different functions while purchasing | Easily move around site functions to make purchases | Lose location on site – main/home and shopping cart. | 3 of 4 sites do not have fixed location main/home or cart. They disappear when scroll down pages | Wrote down shopping cart items and allowed more time to shop. |
| Open Search – uncertain what to purchase | Browse s and moves around many shopping categories to get purchase ideas | Find items to purchase while uncertain what looking for | Search tools need specific keywords related to product categories | Search tools not able to prompt user with questions, and guide user toward purchase suggestions/options | Ask friends for ideas; wander around site in different categories. |

Table 1 : Summary of Mike's activity (Matrix Display

| Object/ Task | Description | Intentions/ Goals | Limitation (what exactly is going on?) | Explanation (why does limitation happen?) | Workaround (how is limitation overcome?) |
|-------------------------|--------------------|------------------------------|---|--|---|
|-------------------------|--------------------|------------------------------|---|--|---|

| | | | | | |
|--|--|---|---|---|--|
| Sorting/filtering | Uses many sorting features to narrow search and make purchase selections | Narrow selection easily to make best purchase. | Not able to easily sort and narrow options. | 2 of 4 sites not able to filter and sort by price (and range) | Allowed more time to search, and wrote down top several options |
| General navigation | Moves to different screens using different functions while purchasing | Easily move around site functions to make purchases | Lose location on site – main/home and shopping cart. | 3 of 4 sites do not have fixed location main/home or cart. They disappear when scroll down pages | Wrote down shopping cart items and allowed more time to shop. |
| Open Search – uncertain what to purchase | Browse and moves around many shopping categories to get purchase ideas | Find items to purchase while uncertain what looking for | Search tools need specific keywords related to product categories | Search tools not able to prompt user with questions, and guide user toward purchase suggestions/options | Ask friends for ideas; wander around site in different categories. |

Table 2 : Summary of Helena's activity (Matrix Display)

4.1.5 Summary

This particular case study demonstrated that although the mobile commerce applications perform generally well, in a growing area of online mobile e-commerce over the next several years, improved ease-of-use applications will help businesses close more transactions, or attain some competitive advantage by making shopping with mobile applications faster and easier, by user not needing to have as many ‘workarounds’.

To make improvements with less workaround, consideration should be given to the following in application design or enhancements:

- Sorting/filtering feature, particularly price, style, and brands
- Easier navigation to key portions such as main menu, shopping cart (something similar to the movable button Facebook uses for Facebook messenger)
- A more interactive “sales rep” type of search feature that prompts user with ideas and filters to help them find and select items to purchase (gifts, etc).

4.2 Questionnaire

To conduct research on the Original Source website we selected the use of a questionnaire as my primary research tool. For this questionnaire we have thirty participants: forty-seven percent are woman and the other fifty-three percent are men. We sent the questionnaire at random to all registered users of the Original Source website and received 30 replies within one week. The majority of users who responded were between twenty-two and forty years old. Only 3 respondents were over sixty years old.

4.2.1 Purpose of the questionnaire

OriginalSource.com has 800 daily visits to its website. This particular website is targeted to people who have an interest in Asian home decoration, artifacts, small gifts, and jewelry. The Original Source Company was established as a wholesaler targeting museum gift shops, independently-owned retailers and occasionally, larger retailers. In the past fifteen years, Original Source Company accumulated a large number of users from the wholesale business sector. Incidentally, this is an example of a business-to-business application of e-commerce.

As part of their deliberate strategy, for the last two years, Original Source Company has begun to make inroads and has started to transition into the retail business segment. For years, they only focused on business-to-business sales. However, they determined that benefits existed for an expansion into retail. The obvious benefit is a higher profit margin when selling direct to the public as compared to stores. Because of this expansion into retail, Original Source company sought avenues to establish more direct contact with the public – or, the retail target market. This is what led them to conclude that a mobile application would be a viable sales strategy. In terms of products, Original Source Company began to see an interest among the public in a diverse assortment of gifts to include small accessories, jewelry and home décor. A mobile application could provide an ideal platform to feature and sell this category of product.

But, the challenge was evident. To expand retail sales, the executives at Original Source Company needed a better understanding of their customers. To develop a mobile app that was both effective and appealing, they needed insights and information to include information on the users' gender, age and frequency of visit. It is for this purpose, that we set forth our survey plan. A high quality, well-constructed questionnaire would allow us to reach critical conclusions on the Original Source Company customer base. The resulting research would then allow for the design and implementation of an effective mobile application.

4.2.2 Pilot test for the questionnaire

Dillman in (Dillman, 2000) suggests a three-stage process of pre-testing a survey. The technique, while quite simple, is rarely done thoroughly. The three stages are as follows: *"1. Review of the survey tool, or questionnaire, by knowledgeable colleagues and analysts.*

2. Interviews with potential respondents to evaluate cognitive and motivational qualities in the survey tool.

3. Pilot study of both the survey tool and the implementation procedures"

After our twenty questions were designed, the three-stage process to pilot test this questionnaire started.

We invited Jessie (all the name in this thesis is alias), who is the E-commerce Manager assistant in Los Angeles California and who has served two years in Original Source Company. She participated in the first step of the test. She satisfied with most of the questions. And she thanked me on behalf of the company in providing an opportunity to understand the user. She made a little request of adding another question to the survey, the question is "What kind of product do you usually shop for online?"

Original Source Company's representative thought that a more precise understanding of user incomes and of the company's product pricing might be better addressed in the questionnaire. Such problems, her the reason is that a more precise understanding of the user's income, then the company's commodity pricing can also help. Also, it is more clearly determine what kind of products needs to be on display in the app trade in obvious locations.

For the second part of the test, we invited two young Americans who like the experience of online shopping. They are my friends, Bill and Jay, who are working at a convenience store three days a week and at night they go to a restaurant second job. They have not bought anything on the Original Source website, but they made a very good proposal. They suggested adding into the questionnaire, "How many hours do you work a week?" Their reason is this; because in the United States in many types of employment, you can decide how long you are going to work in a given week. Many employers are flexible with their employees' attitudes and values. Some employees work full-time and others work part-time. When work for a job, it cannot be seen alone occupation specific user how much free time, and the user determines how much free time they can spend much time on the phone.

In reality, some users are much more active than others, they prefer more interaction after their orders were placed. When some users encountered problems in the process of buying goods, they will call customer service. Usually at this time the Original Source customer service representative will offer some discount coupons as apology for the customer's being inconvenienced by this diversion.

Clearly, these users are users with a spirit of exploration which is very suitable or desirable for a pilot study participants. Regarding this third part, the questionnaire was sent to five users who were asked to fill it out. Suggestions about the questions themselves were to be welcomed. Too, additional input questions were to be welcomed. As a reward for their efforts, they'd be granted a discount on an item of their choice among the company's product offerings.

4.2.3 Send Questionnaire

OriginalSource.com now has about 3,000 registered users, we sent questionnaires to all users. Within one week thirty responses were obtained.

4.2.4 Results gather

The results of the questionnaire as below:

Gender Distribution

There are 14 female respondents and 16 male respondents.

The number of males exceeded our expectation. Original Source executives have reported that traditionally the vast majority of sales in retail stores are to women customers. Yet, the nearly 50/50 split in respondents leads us to believe that online sales may see a higher level of male participation as compared to sales in a traditional retail store setting.

Age Distribution

Age of respondents ranged from 15 to over 60. The majority of respondents (77%) were between 22 and 40. Original Source products reflect traditions and folk art techniques of Asia. People that buy their products tend to have a deep interest in a global community. The fact that most respondents were between 22 and 40 demonstrates that Original Source's message of celebrating cultural diversity was being heard by its customers.

Moreover, the age group of 22 thru 40 is far more computer literate than 50 and above. Anyone between 22 and 40 has been raised with the Internet and feels very comfortable with ecommerce.

Occupation

The assortment of occupation among the respondents is diverse. Interestingly, the largest group of respondents identifies themselves as members of the retail and / or ecommerce profession (23%).

This is encouraging for two reasons. First, anyone in that profession will be quite comfortable engaging in online purchasing. Secondly, there is an element of prestige and credibility. The fact that members of the retail and ecommerce profession felt comfortable buying on the Original Source website, shows this company build trust with the industry experts. The fact that they responded implies a form of support and interest.

Hours Worked Per Week

The majority of respondents worked between 29 – 45 hours per week.

This finding leads us to conclude that a majority of our respondents were likely employed on a full-time basis. For any business, it is critical to target customers who have regular income – something which results from full-time employment. We also believe that those who are employed full-time may in fact spend more time online at the office than those who are not.

Hours Spent on Phone Per Day

A heavy concentration of the respondents spend between 1-2 hours a day on the phone. This amount led us to conclude that the most of the respondents regarded their phones as a key tool to help manage relationships, work and ecommerce. The phone clearly plays an important role in the life of the respondents. We would need further research to confirm how much of the 1-2 hours was dedicated to conversations and how much can be attributed to other mobile activities – such as shopping.

Frequency of Online Shopping

A full 83% of the respondents shop online at least once a month – with 50% of those shopping online at least one or more times per week.

These numbers were higher than expected in terms of the frequency of online shopping. We were particularly surprised to see that 13% of the respondents made at least one online purchase per day.

Average Amount Spent Per Shopping Online Episode

77% of respondents spent an average of \$100 or less with each online shopping episode. Only 7% spent more than \$200 on average.

This does not appear to be out-of-line with traditional retail. The executives at Original Source told us that their traditional wholesale orders (business-to-business) averaged \$150 to \$500. \$100 or less seems as a good start for retailer(business-to-costumers)

Annual Income

As compared to other questions in our survey, the results for this finding were more balanced across a range. Based on income levels, the findings were 17% / 10% / 23% / 27%. Interestingly, a full 17% reported earned income in excess of \$100,000 per year. This result was not too surprising since we had already determined that the majority of our respondents were working full-time. We also knew that the majority of our respondents were at an age where their incomes were likely growing each year (22-40).

Number of Visits to Original Source Website

43% of the respondents visited the Original Source website more than 15 times. 30% visited at least 1-2 times. 27% identified their visits as more than 2 and less than 15 (a few).

The key observation here is that 70% of the respondents either visited a few times (27%) or more than 15 times (43%) leading us to two conclusions: first, Original Source has fairly loyal and consistent customers. Second, Those who had made the decision to respond to the questionnaire were in fact largely regular visitors who were likely very familiar with the site. Which will be much helpful during the participant approach during the next step - design process.

Product Preference for Online Shopping

17% purchased shoes/ make-up / clearance items. 66% were divided between gifts (33%) and decorations (33%). The balance: food at 13% and phone / computer related items at 3%. Original Source sells gifts, jewelry and home décor.

This was encouraging news for us as 66% of the respondents demonstrated a willingness to purchase products that were within the product categories offered by Original Source.

Shopping History with Originalsource.com

30% of the respondents indicate that they often purchase products from the Original Source website. 30% indicate a single purchase. 40% indicate more than 1 purchase (“a few”).

Continuing with previous insights, this reinforces the belief that our group of respondents are loyal and committed to Original Source. Moreover, their extensive shopping experience with Original Source shows that they are well-qualified to answer the survey questions and provide suggestions and guidance.

Ease of Shopping Experience on Original Source Website

13% indicated that the Original Source site is easy to use. 50% encountered at least a few problems – 17% indicate that their experience is hard or difficult – and 20% indicate that the experience is very hard.

It is a cause for great concern when 87% of your customers are essentially saying that they have a problem with almost every single visit to the Site. The fact reveals the majority of visitor encounter problems, it leads us to believe that we will find a better solution during the application design process.

Nature of Problems Encountered on Original Source Website

This section was presented as an open question – requesting written feedback from the respondents. The nature of the problems appear to be more related to basic product navigation and not related to the technical operation of the website. Specifically, the majority of the complaints were focused on 1 of 3 areas:

- Need better quality photos – and more of them.
- Cannot locate desired product
- Cannot find adequate description of the product

Essentially, we concluded that the problems were all related to “online salesmanship.” This was not an issue of technical support – nor an issue related to credit card processing or even logging-in. The complaints focused on ineffective product presentation. The products did not appear to be appealing – often they were impossible to locate – and there was not a commitment to providing adequate written text in support of the product. All of these complaints reflect mistakes with the principles of traditional retailing.

Willingness to Use Phone for Online Shopping

27% have already used a phone for shopping – 37% claim to use it often for shopping – 27% indicate an interest to try – and the remaining 10% would prefer to shop online through a website. It is encouraging to see that 64% have either already tried using a phone for online shopping or use it on a regular basis for shopping. The overwhelming majority of respondents are very comfortable with the concept of using a mobile phone app for online shopping.

Preference Between Original Source Mobile App and Original Source Website

In this question, we sought to address whether a respondent might prefer to use an Original Source phone app to shop versus shopping at the Original Source website. 43% of the respondents indicate that they actually prefer to shop from Original Source by using a mobile phone app. 37% are open to try at least once – 10% have no preference and the remaining 10% distinctly prefer to shop at the Original Source website. The clear conclusion is that the majority of respondents are ready to use a phone app to shop from Original Source.

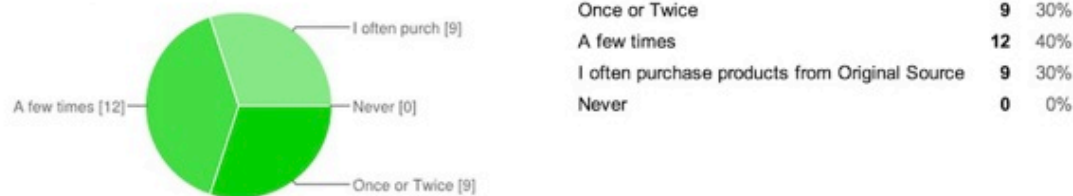
New functionality

57% of respondents showed their strong interest in "Rating products", one respondent even requested to put comments on products. In addition to that, respondents also showed high interest in "Shopping history", "Product order tracking", "Product recommendations" and "Discounts galore".

10. What kind of product you usually shopping online?



11. Have you ever bought products from OriginalSource.com?



12. How do you easy do you think it is to shop on OriginalSource.com?

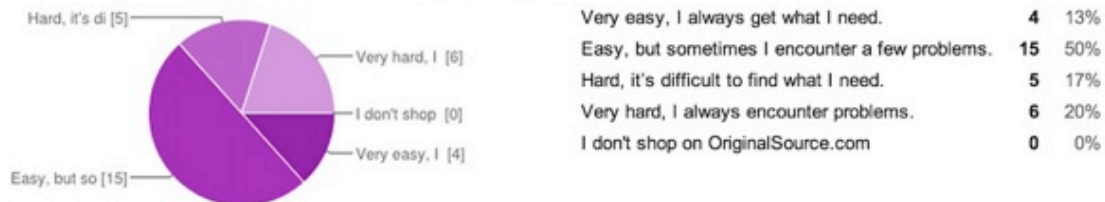


Figure 3: Summary of Questionnaire of Original Source.com

The following section attempts to measure the degree of interest in various features that could be provided on the Original Source mobile shopping application. The respondents were presented with 5 possible features on the mobile phone app – and asked to rank the features in order of importance:

In order of importance – the features were ranked as follows:

- Product Order Tracking
- Rating Products

- Product Recommendations
- Discount Galore
- Shopping History

These findings lead us to conclude:

Original Source must provide a tracking system that allows customers to enter a reference number to determine the status of their order and delivery.

We note that product ratings are very important which is not surprising as younger buyers are readily and easily influenced by peer reviews of products.

Additional Comments – The final section of the questionnaire allowed for the respondents to make additional comments. Two comments were provided.

1) The first is of particular importance in that it refers to the possibility of a discount for using a mobile phone app. This is a common and powerful marketing tool – the use of a discounted price for online purchasing. We should certainly take this into consideration as Original Source could use this as a tool to accelerate the movement of users from the website to the phone app.

2) The second recommendation was a request for additional product comments. Original Source should be able to easily correct this and allow a section for users to add more comments about a product.

4.2.5 Summary

The questionnaire sought to confirm whether the introduction of a mobile phone app was a sensible and correct decision to support Original Source's sales plan. Original Source has been a wholesaler (business-to-business) for over 17 years. Two years ago, a decision was made to evaluate the opportunity to sell direct to the public (retail). As part of that decision and effort, the executives at Original Source are considering multiple sales channels to reach the public. One such channel – and the focus of this thesis – is the development of a mobile phone app. The idea is that such an application – with its convenience and ease of use- would be a strong tool to further build retail sales.

As such, our research was undertaken to confirm if our target audience would be open to the use of a mobile phone app. The survey include a series of questions that were designed to gauge and reveal the strength of this idea. Was our target market interested? – were they willing? – were they excited by the prospect of retail purchasing thru a phone app.

The questionnaire provided some very revealing results.

Results:

- Users of Original Source.com are very comfortable with online purchasing.
- Users of Original Source.com users are generally employed and well-compensated.
- Users of Original Source.com users have purchasing power.
- Users of Original Source.com users are tech-savvy and their phones have a critical role in their daily lives
- Users of Original Source.com users are not satisfied with the current website.
- Users of Original Source.com users are generally loyal and appear to be have strong interest in products of Original Source.com
- Users of Original Source.com users indicate a willingness and preference to purchase through a mobile app

Recommended Action

- 1) We recommend that Original Source company develops a mobile phone app.
- 2) We recommend that Original Source company recognize the relatively younger market segment of their customers and have that impact the design of the mobile phone app.
- 3) We recommend that a much greater effort is made to make the app and website more appealing through the use of better visuals – both in the form of product photos and in descriptive text.
- 4) We recommend that Original Source company offer a greater number of lower priced products on the app. Their users are more comfortable with purchasing \$50 or less – as such, the product mix should reflect a heavier concentration of lower priced items.
- 5) We recommend that the majority of products be comprised of small gifts and decorations.
- 6) We recommend that Original Source company make an effort to have the application appear more stylish and contemporary to reflect that younger demographic of their users.

Chapter 5

Design Process

5.1 Future Workshop

5.1.1 Planning

Our goal is to get basic understanding of the Original Source website usability, to find both the effective part of the webpage and the critical part. According to the present function of the Original Source website, we want to explore the new possibilities of app development. Next step, discuss the basic function of the app, and establish a prototype of the basic interface design.

| | |
|-------|---|
| 17:00 | Start |
| 17:05 | Preparation Phase – Short Introduction and Ice breaking talk |
| 17:10 | People were required to look through the website by laptops, they were offered a pad of 3M post-it notes and one piece of white paper to write down their thoughts. |
| 17:25 | Critique phase - Everyone talks about the webpages, also use stickers to make notes, negative feedback. |
| 17:40 | Fantasy phase - Every one talking about the solution. |
| 17:50 | Give the questions to all the participants – what should be kept in the iPhone app design – they start to discuss about it. |
| 18:00 | Implementation phase - Everyone started to draw an interface of the iPhone app. |
| 18:30 | Everyone presents their personal ideas. |
| 18:40 | The end |

Table 3: The Schedule of Future Workshop (June 18th, 2014)

5.1.2 The Future Workshop

Vidal (Vidal, 2006, p. 4) defined that “A future workshop is comprised of 4 phases:

1. Preparation Phase
2. Critique Phase (Brainstorming)
3. Fantasy Phase (“Wish List” of Changes)
4. Implementation Phase (Potential Realization)”

5.1.3 Preparation Phase

We approached the preparation phase by separating tasks into three categories: a) logistics b) participants and b) framing the problem and purpose of the future workshop.

With logistics, my focus was on creating an environment that would encourage cooperation, group creativity and open communication. To reach that, we realized that the comfort and lay-out of the workshop must be comfortable. The participants should be able to establish a personal comfort zone very easily.

We chose a very comfortable classroom for the future workshop, with soft lighting and a large clean table. All the participants were treated exactly the same. The focus was on establishing the look and feel of a classroom from their past. We wanted each to feel as if they were once again a student sitting in a class – with no other influences of daily life and work. We made sure that the room was void of any image, sign or object that might be a cause of discussion or analysis. We did not want attention or creativity to be diverted elsewhere. We made sure the room had a simple large table – and of course, It is sure the room had a carpet (which is a critical accessory when you ask participants to sit on the ground). All supplies were neatly arranged on the table and included pens, pencils, tape and of course, the important 3M Post-It notepads.

We also made sure that the room had plenty of light snacks (nothing exotic) such as crackers and cookies. Coffee and tea were also available. All of this was provided to establish an atmosphere of comfort and collaboration with the users.

With participants, my focus was on bringing together individuals with very different socio-economic backgrounds. We wanted diversity of opinion and we wanted diversity of skills and experience. We spent considerable time evaluating their personality and background. We attempted to gather insight into their education, their lifestyle and current job. One of the most important considerations was to make sure that each participant was well-suited for an Future Workshop. This did not mean that they all needed to think alike, but rather that their personalities were suitable and conducive for collaborating with others for the purpose of pursuing a mutual goal. Though we definitely wanted diversity, we did not want disruptions or personality conflicts that might negatively impact the FW process.

Participants:

All the participants are equal in the democratic problem solving process (René, 2006) we selected 5 people with different ages and different background in the future workshop. According to the questionnaire responses, we knew that most of Original Source customers are between 20~40 years old. As a result, when we selected the participants,

we pieced 2 men and 3 women – ranging in age from 20-40 years old. All participants were from America or China.

Participant F1: Chinese Woman Housewife (33)

Chinese Woman F1 is in her early 30s. From my own observations, she is an intelligent and articulate. She is college-educated but we do not believe she has any formal work experience. Most importantly, she is clearly comfortable speaking in front of others. She is animated, energetic and very talkative. We would actually describe her as being very outspoken and confident person. Her involvement and impact on the Future Workshop experience was profound and very impactful. It was her energy and self-assurance that set the key tone for the critique phase. She spoke first and her enthusiasm and interest in the subject matter was very clear.

Participant F2: American Business Man (35)

At age 35, Participant F2 had already several years of business experience. He has a master's degree in business and has worked in sales and marketing for 10 years. He has spent several years in China. His professional experience was really based in traditional sales – which we believe has relevance to his outlook on eCommerce. For several years, he had worked directly with customers – using traditional sales techniques to sell products and services. My own initial observation was that while Participant B was well-trained in traditional sales – but, we also sensed that he was not fully comfortable with eCommerce. It was as if eCommerce represented a style of selling that did not fully reflect his skill set. When we first met him, we recalled how he would discuss his experience in meeting clients and convincing them of the value of products. Yet, when we tried to direct our discussion to eCommerce, he was clearly less confident.

Participant F3: American Woman Graduate Student (25)

As a graduate student studying overseas, Participant F3 conveyed a sense of enthusiasm and interest. Her attitude was one of openness and tolerance. She was enjoying her life overseas and it was clear that she took pride in her ability to be open-minded. It was obvious that she found opportunities to show others that she was not judgmental. For her, tolerance was a sign of maturity and intelligent. In some respects, she was the exact opposite of Participants F1 (Chinese woman house wife) and Participant F2 (American businessman). Where Participant F1 was full of sharp criticisms and strongly-held opinions, Participant F2 was relaxed, tolerant and accommodating. And where Participant F1 was serious, aloof and experienced, Participant F2 reflected an attitude of open-mindedness and youthful enthusiasm.

Participant F4: Chinese Man College Student (20)

This participant is friendly, outgoing, but extremely analytical. His personality leads him to constantly question any existing process or method. At times, this intense desire to

always question can be interpreted as pessimism or even aggressiveness. While he is very comfortable with technology who is not a frequent online shopper – but he does shop occasionally. He does speak with a tone of authority even on topics where he may not have any true experience or expertise. As such, he relies on his sense of confidence and tonality to make people agree with his suggestions. When we first approached him for the workshop, he immediately conveyed a sense that he had “plenty of obvious suggestions” that would significantly improve the website.

Participant F5: American Woman PhD. Candidate (28)

She is thoughtful, quiet and careful in her words. She is reserved and attentive when others speak. Initially, we thought she was shy and timid. However, we soon noticed that when she is presented with an idea or an opinion, her quiet nature changes and she becomes very animated and vocal. However, she never loses her sense of reserve and her formal demeanor. She is a very skill talker in that she relies on high quality content and words to express herself – not volume or personality. She also is a frequent online shopper. Though her personal style seems to be very conservative and she is not the type of person to buy a designer bag, it became clear that she truly enjoys the shopping experience. She buys both serious products and even fun, lighthearted products. In some respects, we wondered if shopping provided her with at least one outlet where she could act more freely and with such reserve and seriousness.

After addressing both the logistics and participants for the FW, we then focused on making sure that the participants were very aware of the purpose of the future workshop. While logistic planning and participant selection took place before the actual workshop day, the description of the problem and our true purpose took place at the beginning of the workshop. While we had already discussed purpose of the future workshop during the initial selection, we also wanted to review it again during the initial workshop.

To accomplish this, my first objective was to communicate the overall problem to the participants. we wanted to establish the purpose for the workshop by addressing the problem in its broadest terms. At this moment, we avoided all details regarding the Original Source website. We simply illustrated the primary issue by saying that Original Source was a successful retailer which has always relied on traditional sales methods to build revenue. We briefly mentioned that Original Source used a combination of sales representatives – along with a printed catalog – to generate purchase orders across the United States. We then mentioned that Original Source recognized that the marketplace was changing. More and more customers were turning to eCommerce. we explained that Original Source was concerned that they were “falling behind” – that they did not have a strong strategy for eCommerce. While they had a very strong plan for traditional sales techniques, they felt that their current website was under-performing. The website was simply not maximizing the purchasing potential of their customer audience. Suddenly,

they felt vulnerable as a business. We did not want to share many details, but we did want to provide relevant and necessary background information. We wanted to establish a strategic reason for the workshop. My goal was to establish a clear theme and identify the problem. The theme was an ambitious Company eager to grow and stay relevant by improving its eCommerce strategy. The problem was that their primary tool for eCommerce – their website – was poorly designed and not nearly as effective as it should be.

Finally, before we began the actual critique phase, we wanted to make sure we had a spirit of collaboration among the participants. My hope was to minimize influences among the group that might lead to a traditional sense of hierarchy. We understood very clearly that we were seeking to establish a very democratic and egalitarian atmosphere. We did not want social influences such as clothing, jewelry or accessories to impact participation of the participants.

For my future workshop to be successful, we needed to overcome these visible and non-visible influences. We needed to create an egalitarian setting that would result in a sense of empowerment by all participants.

To accomplish this, we first asked everyone to leave their purses, backpacks, laptop cases safely on a nearby table. We then asked everyone to sit on the floor – in a circle. We could clearly see that sitting on the floor was not something that all participants were accustomed to. Sitting on the floor – especially in a circle – is a popular method to talk to children in school. It puts everyone on a much more equal standing – everyone is facing everyone – and no one is physically more dominant than another. It is really a good technique for bringing people “down” to an equal level. My focus was on creating a sense of equal empowerment among all participants.

Though each individual participant was a mature professional, we did realize that this setting was both new and different. As with any gathering of individuals, both subtle and obvious symbols of social standing and hierarchy could influence the mood. Addressing these issues during the preparation phase was a critical part of the future workshop.

5.1.4 Critique Phase

With this as a background – we entered the critique phase. “Critique Phase will draw out specific issues and problems in questions, the objective is to establish a critical understanding of the theme and the problems in question”. (Vidal, 2006, p.6)

The first step of the critique phase is the divergent process. Using the technique of brainstorming, the participants were encouraged to provide their own ideas for the Original Source website. For me, the key focus was on a group visualization of the issues and criticism. We did not want insular, individualized analysis. The goal was to encourage everyone to be vocal. we wanted to create an active brainstorming session that encouraged a free-flow of comments and complaints regarding the current and present system. The critical phase is aimed at exposing and revealing the actual situation and problem.

According to the questionnaire data we gathered, it is easy to determine that there are some users who are complained about the inconvenient function and usability of the Original Source website. These users expressed the critical need to improve the user experience. Based on the requirement of a new app design, our focus was to engage in a critical evaluation of the original webpage – remove the design features which were inconvenient for the user – determine which functions should be kept in the app. The purpose was to then recommend new features which might be a good discovery for the application design– even if they were not necessarily ideal for the website. At the onset, the participants were encouraged to open up – speak without hesitation. We made it very clear that there were no boundaries on their ability to express their genuine feelings. we encouraged everyone to freely describe any frustrations or concerns.

Following the principles of Future Workshop, we encouraged everyone to talk and openly criticize the current Original Source website. There were no boundaries at this point. Both my tonality and mannerisms were encouraging and supportive of all participants.

One key element of the critique phase related to the expression of very strong feelings. If a participant felt particularly negative about a feature during the critique phase then, he or she was encouraged to then recall that feature during the upcoming fantasy phase. Participants were reminded that particularly negative features should be given greater attention during the fantasy phase.

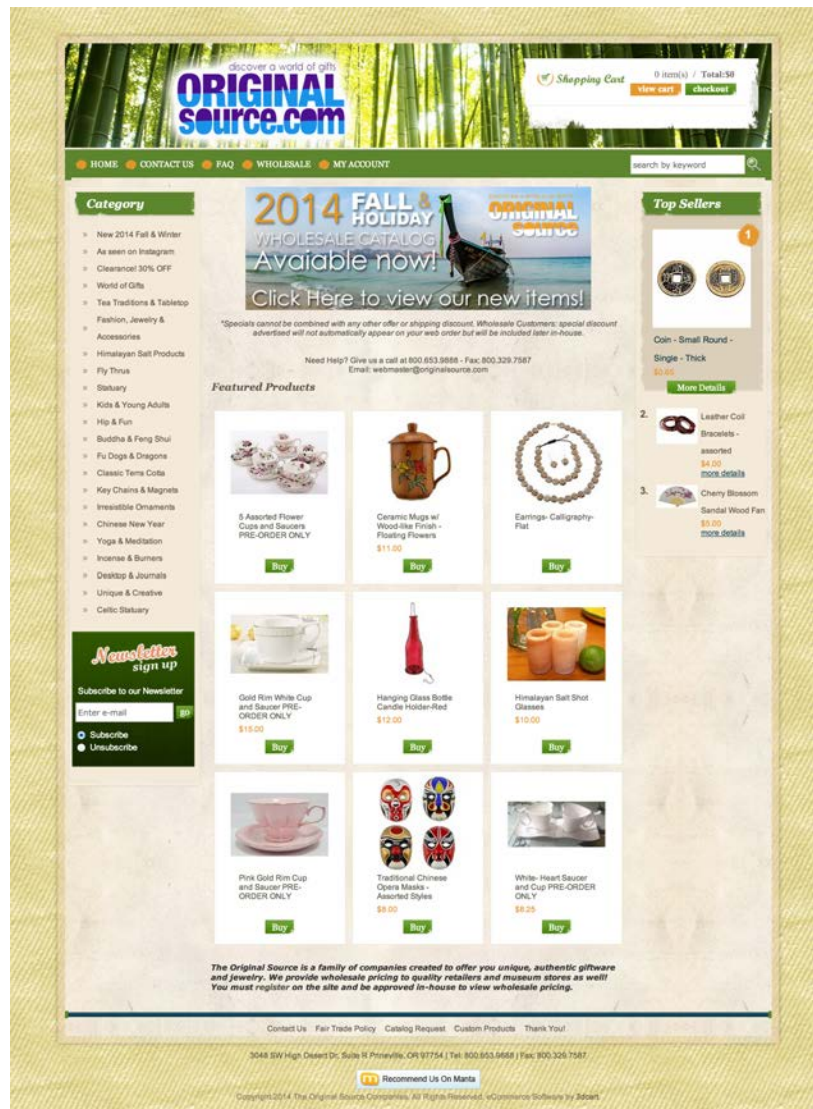


Figure 4: The Home Page of Original Source.com

In regards to generating a list of complaints and criticisms, we did not want anyone to “retreat” to their own individual list. It is too easy to criticize in private. We did not want an environment where the participants quietly sat in a circle with each writing out their own list. This was a time for everyone to be heard. We wanted to create an imaginary net to capture the free flow of ideas. The question was what is an effective method to encourage a rapid, unfiltered flow of ideas? From our reading, we have learned that the use of small 3M post-it notes can be effective in the divergent process. Post-it notes offer an advantage in that they appear much more casual and less structured than an individual list printed on a paper. By their very design, they limit the extent that someone can write – forcing us to right direct and condensed ideas. Moreover, when a

participant writes a criticism on a post-it note, the criticism then has to be removed (peeled-off) and stuck somewhere. The process of “sticking a post-it note” was in fact a perfect method to compel everyone to share and see all comments. All post-it note comments were immediately adhered to a large white-board during the divergent phase. As a key point, we found post-it notes are useful in the divergent phase because: a) they are less formal b) they make the information more visual and public – easier to share.

At the beginning, most of the participants seemed a little bit shy. We quietly observed that everyone was concentrating on the Original Source Home Page. We were not sure if their concentration was genuine (as if they were really interested) or whether their concentration was an “act” – an effective way to avoid contact with each other. We could hear a soft murmuring of discussion from the group. However, there was indeed a real sense of energy. All that was needed was a spark to launch the brainstorming activity. The spark of energy came from Participant F1 – Chinese Woman.

Participant F1: Chinese Woman Housewife (33) – Participant A began her critique by directing attention to herself. Instead of focusing on the actual website, she sought to capture everyone’s attention by discussing just how much she loved to shop. Her comments tended to be spoken in the 1st person. Examples of her opening statements include:

- I am a “typical woman – I love to shop – for me it is recreation.”
- I shop to relax and to take my mind off of work. Shopping is my passion.
- When I visit a retail store – or an online retail website...my number one requirement is that I feel excited – I feel intrigued and enthused. I want to feel happy!
- When I open a retail website, I want to fall-in-love with products. I want to forget all of my other problems and just become consumed with the shopping experience.

As she spoke, we noted both her enthusiasm and confidence. But, we also observed something else – something very different than what we expected. As Chinese Woman A spoke – it was not simply an expression of her opinions. We also sensed something else in her words – something which we describe as persuasion. She was not just telling us her opinions on the website – but, she was actually speaking in a way that attempted to build a group consensus. She was literally trying to “sell” us on her opinion. It was almost as if she was trying to persuade others to agree with her. We felt this was an important observation.

After speaking with so much animation at what she loved about shopping, she then turned her attention to the Original Source Website. Just as she displayed great passion and interest in shopping, she also displayed significant energy as she began her critique. To a degree, it appeared as if her sharp and extensive critique of the Original Source website originated in very genuine and personal feelings. She was not just criticizing a

website – instead, she was criticizing something which failed to meet her expectations. We then realized that she was looking upon the Original Source website flaws as an intensely personal disappointment – as if the website’s flaws were an attack on her treasured shopping experience. We imagined her saying “How dare Original Source not give me the shopping experience that I deserve?” Her comments were very strong and critical. Some of her comments were insightful in terms of genuine flaws – but other comments sounded immature and almost silly.

Her critique continued. Again, some of the comments sounded logical – such: “Is there a way we can see my recent order history?” But other comments sounded childish such as: “Why aren’t there any cool flashing banners?”

Participant F1 had played a vital role. Her energy, confidence and enthusiasm had served as the key to initiating participation – this was productive. But, on the other hand, her personality was dominating and was in danger of causing others to lose interest. As we observed this group interaction, we were relieved to see that another participant was ready to offer feedback – Participant B American Man.

Criticisms listed by Participant F1

1. The website is ugly...I don’t like the design.
2. I want to shop before I log in my account.
3. The products do not look pretty in this layout.
4. The button” Create New Account” is too small to be noticed.
5. No search histories and browser history. I want to know what I bought before.
6. When I shop, I want to get excited – but this design does not make me enthused.
7. It is too boring!
8. I want to see the top-sellers only
9. Where are the discounts and specials?
10. Can’t the website be more colorful and pretty?
11. Isn’t there a rewards program for customers that shop a lot?

Participant F2: American Business Man (35) – When we began the divergent process, Participant F2 was distant and somewhat aloof. While Chinese Woman F4 was busy telling all of the participants of how much she loved online shopping, Participant A was disengaged. But, slowly as other participants began to write notes and exchange comments – he became more attentive. What we did observe is that his comments tended to focus on the user experience. His focus was not on navigation or technical features – but rather how the products were described and presented on the site. We attributed this to his extensive experience in direct product sales. It was clear to me that his focus was on what he knew. His knowledge was centered on how to sell a product. This was his professional skill set and it was reflected in the nature of his criticisms. Most of his

criticism were all focused on how the products were sold (presented to the visitors of the site).

Criticisms listed by Participant F2

1. The banner on top of the website is ugly.
2. Product photos are too small – do not show beauty of product.
3. Products need more description – more text to describe their value.
4. Product photos should be higher resolution.
5. There should be a greater focus on policies that guarantee customer satisfaction.

Participant F3: American Woman Graduate Student (25) – Participant F3 began the critique phase with a lot of body language. More so than the others, we noted her gesturing with her head and arms. As Participant F1 began her persuasive and self-centered comments about shopping, Participant F3 nodded frequently. However, we could not determine if her head-nodding representative agreement with Participant A or was merely a symbol of courtesy. The criticism provide by Participant F3 was more diverse than Participants F1 or F2. She seemed to shift her focus quickly – never concentrating on one feature, but rather moving quickly between multiple categories. If one Participant criticized navigation, we noted that shortly thereafter, she would criticize navigation. If one Participant criticized product presentation and categories, her next criticism would follow within that same subject.

Criticisms listed by Participant F3

1. Font is bad aesthetics.
2. Navigation bar is repeated at the bottom of this page.
3. Too many categories and too many layers
4. Ugly layout
5. The picture of products are not unified, some product with a white clean background, some are busy background
6. No comments of each products
7. Sometimes it is hard to find log in button
8. There are 2 button goes to different webpage but have the same name "Home"

Participant F4: Chinese Man College Student (20) – Participant F4 began by listening intently to the other participants or at least that is how it appeared. He was friendly to others and nodded, but we also observed a sense of impatience. At one point, we did not that he tended to interrupt others as they spoke and would attempt to finish their sentences. When he did make comments, he spoke with authority and confidence. His

tonality was friendly but still confident to the point where it almost sounded as if he was lecturing others. In terms of criticisms, his focus was on technical features. He did not seem to be interested in the actual products or presentation but rather criticized the log-on process, navigation and flash ad.

Criticisms listed by Participant F4

1. “Select” function is missing. I cannot select specific category product, such as on sale product, cheapest product.)
2. Navigation is awkward and not intuitive.
3. Log-on process is slow and not as fast as it should be. Needs to be an easier recovery of a password.
4. It is very slow for my computer to upload the flash ad, in the first 30s, it only appeared a rectangular blank which was really confused me. Later on, I realized it was a flash ad, but the alternative picture was quite slow.

Participant F5: American Woman PhD. Candidate (28) – Participant F5 began by focusing almost exclusively on writing on the small post-it notes. While the others slowly started to increase their talking, she remained focused on the small post-it pad in her hand. We were not sure if she was even listening to the other criticisms or whether she was just concentrating on recording her feelings. She would write – and then peel off a post-it and adhere it to the white board. But, after several minutes, she began to take greater interest in the group around her. She did make comments and did communicate in a supportive tone. But it did appear to me that she had already reached her conclusions and was now simply observing, making light comments and being friendly.

Criticisms listed by Participant F5

1. The logo doesn't match the background.
2. 3 Top seller product is not enough.
3. The button "More details" under "top seller" is confusing.
4. The space for flash AD is too small.
5. Category area takes too much space of the webpage.
6. "Buy" Button is confused.
7. "Your price" button is confused.
8. Disordered category
9. When I press "category" button, there is no obvious response
10. No place for me to order product by price.
11. It's hard to find the log in entrance.
12. Too many products are displayed in one page,

Throughout the divergent phase, the participants were quickly writing criticisms on the small post-it notes. At the same time, they were verbalizing their opinions. There was definitely a point where there was a rush and momentum of criticisms that were being spoken and written very rapidly.

Convergent Process

The second step of the critique phase is the convergent process. While the divergent process focuses on the collection of criticisms, the goal of the convergent process is to categorize the criticisms into different groups.

The goal was to create a mind-map by grouping the critique into primary groups. In total, 33 suggestions were assembled – and we separated them into the 7 key groups – each reflecting a key functionality of the site.

Mind Map

- Group 1 – Product Categorization (5 criticisms)
- Group 2 – Website design and artistry (10 criticisms)
- Group 3 – Navigation Bar Design (3 criticisms)
- Group 4 – Log-In Procedures (5 criticisms)
- Group 5 – Product Display (2 criticisms)
- Group 6 – Product Preference /Popularity (1 criticism)
- Group 7 – Browser History / Search History (1 criticism)

5.1.5 Fantasy Phase

When preparing for the fantasy phase, the words from my reading that impacted me the most were: utopia, exaggeration and future. In a very real sense, the conduct of the fantasy phase aims to incorporate an element of each. The fantasy phase is exactly what it sounds like. It is a moment of unfiltered and unrestrained creativity to suggest all possible solutions. It is a process by which complete optimism and enthusiasm are encouraged for the purpose of recommending any possible solution. It is a time when everyone has a great idea.

Similar to the critique phase, the fantasy phase is also divided into two parts: divergence and convergence.

With divergence, all suggestions and ideas for improvement are acknowledged and regarded as possible. With convergence, the screening process begins. Each suggestion

is evaluated and those that are regarded as completely unrealistic are removed. Only the usable ideas will remain.

From my reading and research, we understood that it is far easier to get a group of people to criticize a process or thing – then it is to get that same group of people to suggest ways to improvement. We believe humans might find pessimism a more natural and less vulnerable position for than optimism. Thus, while it was generally easy to get the group to engage in the critique phase, we believe the fantasy phase posed a greater challenge. To address this, we relied on a method recommended in my reading to facilitate suggestions. This method is the use of story-telling as a way of communicating ideas.

The story-telling approach was made possible by our physical configuration. At this time, we still all remained seated on the floor in a circle. It was very much like a story-telling scene that you would find in a classroom of young students. Of course, at this juncture, we had just finished a very active and energetic dialog of critique. That phase was very verbal and even a bit loud. At times, certain individuals seemed to struggle to be heard. We realized that for the fantasy phase, we needed to change this.

We began by suggesting to the group that we change the nature of our communication. That instead of everyone speaking and writing all at once – that we would approach the problem-solving (divergent phase) as if it was a fairy tale with each of us contributing a section. We would literally begin by one random person saying “Once upon a time, there was a website that needed help. It wanted to be a rich and famous retail site, but it did not know how.”

Then, after that opening sentence, we would slowly go around the circle of participants with each participant making a suggestion to help our “poor website.” In the process of making this suggestion, we encouraged everyone to role-play in some capacity. Each person could even assume a role and character (and if they wanted, could even change their voice a little). The entire purpose was to make people smile and feel more relaxed to suggest any improvement regardless of how crazy it might have been.

Initially the participants were conservative and their recommended improvements were limited to visual changes to navigation, color and images. However, to facilitate additional input and to help the process of co-design, we started to make suggestions – and we intentionally suggested “crazy” ideas. Of course, we maintained our story-telling atmosphere. we pretended that we were all magical wizard that could grant anyone their wish.

In terms of content, we assembled a wide range of suggestions during the divergent process (of the fantasy phase).

Participant F1: Chinese Woman Housewife (33)

Solutions:

1. Making a better banner
2. Using keys word search.
3. There is no need to show big picture of products in the home page, if yes, shouldn't be flash, too slow.
4. Replace the current navigation bar as Breadcrumb Navigation.
5. Allow user to shopping before login
6. Should be more picture and icon instead of using words.

Participant F2: American Business Man (35)

Solution:

1. Changing current font to a specification font.
2. Delete the top navigation bar "Contact us"
3. Reclassify category, no need too many detail, just big category ,
7. Make beautiful layout
8. Using unified product picture with white background.
9. Create a new function for customers put comments
10. The log in button is too hidden, should be in the top right corner
11. Change one "home" to another name

Participant F3: American Woman Graduate Student (25)

Solution:

1. Create: check box", people should be able to select product display by price, on sale.
2. 9 product in one page is better
3. Should be more picture and icon instead of using words

Participant F4: Chinese Man College Student (20)

Solution:

1. I want a place to look through all the products without category.
2. "Contact Us" button shouldn't place in the top navigation bar.
3. Make the "Create New Account" more striking.
4. Create a new function let people to see search histories and browser history.

Participant F5: American Woman PhD. Candidate (28)

1. Make a better look logo
2. Top seller should be more than 3, maybe Top 5 is better.
3. The button "More details" is no need, should be "More products" instead.
4. Create a big flash AD

5. Category should be hidden sometimes, giving the webpage more space to display products.
6. Change “buy” button to “Bookmark” and “Add to cart”
7. Change “Your price” to “Price”
8. Category should be divided to main category – middle category – small category
9. Make the interaction with website more smooth.
10. There should be a place to select products by price. For example, from cheap to expensive, or price like ” \$1-\$20” “\$20 – \$50”
11. Make log in button more striking.
12. Should give customers rights to decide how many products displayed in one page.

5.1.6 Implementation Phase

At this point in the workshop, a tone of reality, common-sense and practicality is introduced. It is at this point where constructive boundaries are established for the purpose of identifying what options are truly possible.

As a group, we engaged in a discussion. But, the tonality and feeling of the implementation phase was different as compared to the critique and fantasy phase. No longer was the room filled with rapidly talking – and quickly writing participants. No longer were certain individuals making an effort to be heard above the others. Now the tone became pragmatic. People spoke more thoughtfully and even more quietly.

Part of the implementation phase is to establish the best ideas – to identify the priorities among all of the suggestions. But, to accomplish this, we needed to have a closer examination of each of key suggestions. Using a very light and non-authoritative tone, we decided to seek more expert commentary from specific individuals. For example:

Participant F1: She clearly has a passion and love of shopping and style. As such, we tried to encourage her to comment on the quality of the Original Source products – were they stylish? Were they appealing? Were they trendy?

Participant F2: He has extensive sales experience – so we gently encouraged him to comment on whether or not the product presentation and descriptive language was effective.

Participant F4: Because of his IT background, he was encouraged to comment on the logic of the log-in process. Did it make sense – was it clear – was their another option?

The most common requirements are that survived from the fantasy phase follow.

The final phase was realization and that is when common sense and reality provided the guidance for the comments. After the enthusiasm of the fantasy phase, we encouraged the participants to discuss and re-evaluate all of the suggestions – with a focus on changes that were realistic and likely possible.

After participants stopped making all the crazy ideas, we let them to discuss the most important functions, because for an app design, a limited mobile screen can not offer every detail. So they started to discuss about ideas and summarized them as below:

1. A Home page is required, it will be the first page showing up to users when they open this app. Give customers an overview of this online shop, and it should be well designed to get user's attention.
2. There should be a search bar for people to search certain product they want
3. There should a cart place for shopping. Customers can see how many products they are going to purchase, and how much the price in total.
4. There should be a place for user account.

All the 5 participants draw their ideas in 10 min.

Participant F1:

She is trying to make a stylish layout with clear category.

Participant F2:

It can be seen that F2 prefer to display all the function by 4 box instead of 4 tags. His interface design shows that a clear layout is the most important thing to him.

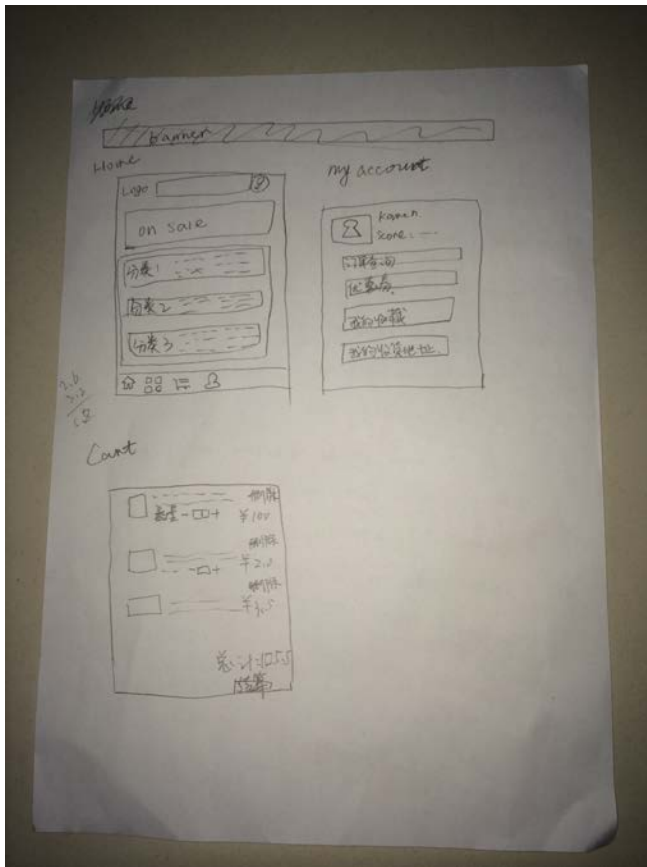


Figure 5: The paper prototype of participant F1 (left) and F2 (right)

Participant F3:

1. F3 loves to see the best sale of the products.
2. She wants to choose the category before she starts to shopping. To her, a clear classification is not ignorable.

Participant F4:

He seems more creative, the way he design is more modern and novelty. He has a very unique view of interface design. Orders, Shop, Account information and Friends are radially arranged from the center of the account photo. In his design, users can add other users as friends and follow their daily shopping behavior.

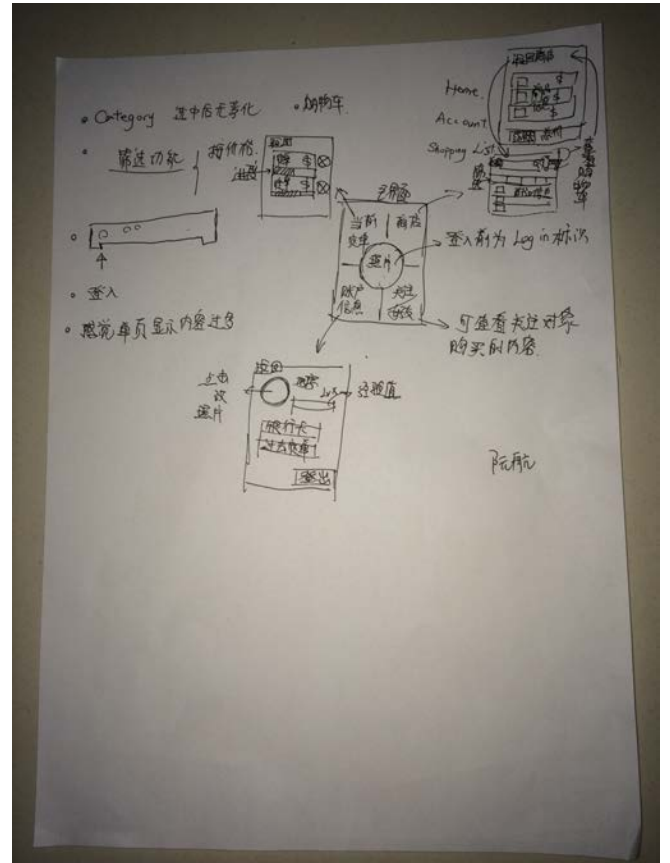
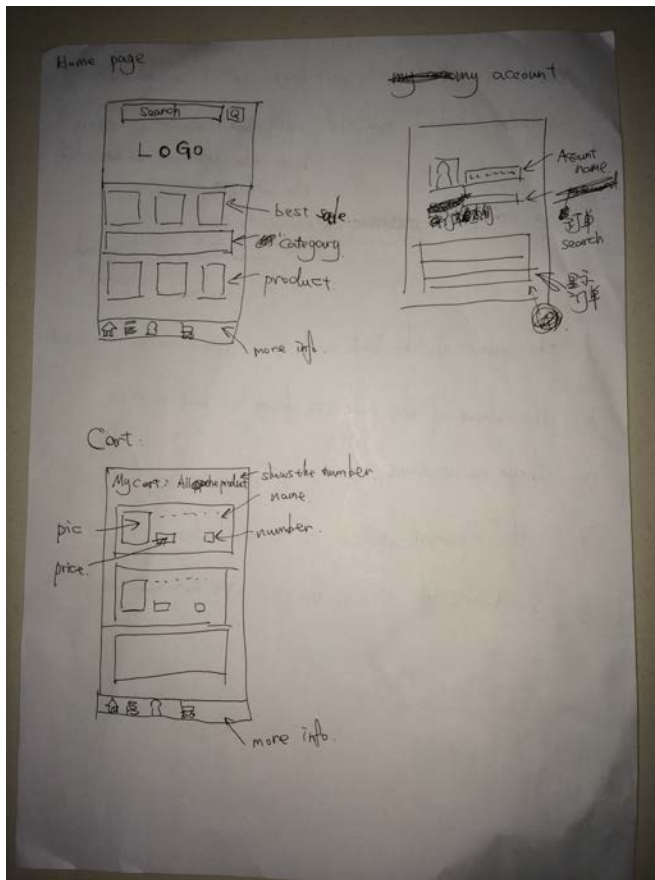


Figure 6: The paper prototype of participant F3 (left) and F4 (right)

Participant F5:

F5 kept the Flash AD function from the website and actually made it larger.

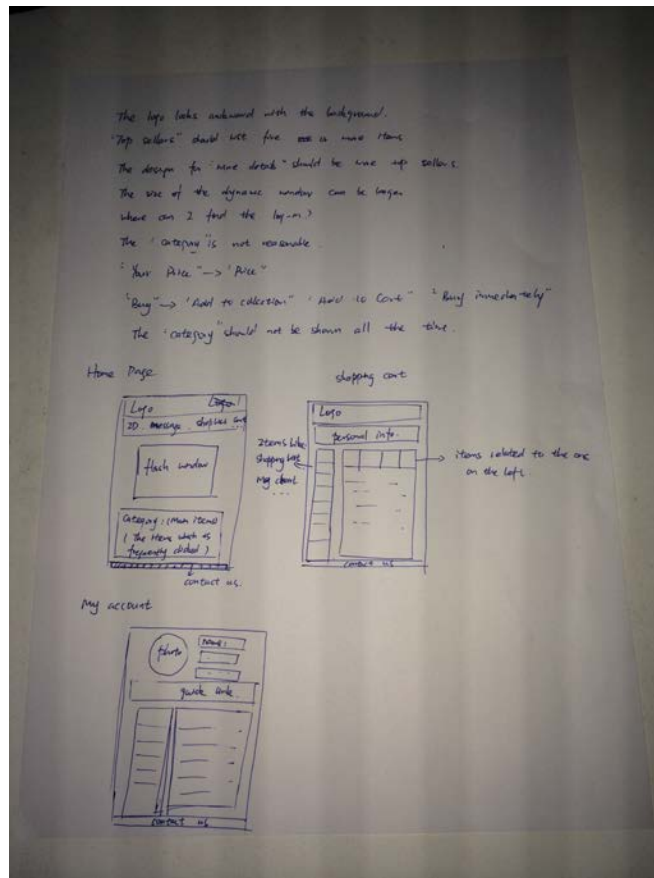


Figure 7: The paper prototype of participant F5

5.2 Perspective Workshop

5.2.1 What is Perspective workshop

The main focus on this workshop was to provide a prototype as a thing to think with (Brandt, 2007). Each form of workshop offers different advantages. For our design process, we selected the perspective workshop.

The primary advantage of a perspective workshop is in the totality and completeness of technological evaluation (Teknologi-Rådet., 2014). A technological process or challenge is evaluated in terms of its potential, its weaknesses and problems. Moreover, ideas, speculation and myths associated with the technology are discussed. This workshop offers an ideal environment to candidly address all aspects of a specific technology.

Why did we determine this particular workshop was suitable to address the development of the Original Source mobile app? In addition to its heavy focus on evaluating all sides of a given technology, the format of the workshop encourages the creation of multiple idea lists which are displayed prominently for all to see. The process by which an app is designed is characterized by dozens of comments and ideas each applying to one of the multiple pages or processes of the app. We need a format that allowed us to capture and immediately share all these ideas at once. A Perspective Workshop is an ideal format for active brainstorming and evaluation of a high number of comments (Teknologi-Rådet., 2014). Moreover, this type of workshop depends very heavily on the unique background and experience of its participants. With this workshop, diversity in experience is an asset as it will result in a greater variety in both perspective and opinions. In the end, the participants must find a way to make sure that their very different perspectives result in an agreed upon action plan.

The perspective workshop has been developed by the Danish Board of Technology.

It includes 4 steps:

3. Present situation
4. Consequences
5. The Future Scenario
6. Perspectives

5.2.2 Preparation

For our workshop, we decided to bring in a new group of participants, again, the customers of Original Source. The announcement was sent as an email, with a promise of the small reward for participation. We selected five persons between 22 – 40 years old to participate and invited them to come to the workshop at the Original Source office. The purpose of utilizing a new group of participants was to introduce fresh ideas, new opinions and different perspectives. We wanted a new group that was completely different from the group used for the Future Workshop.

Participant P1: 35 years old Chinese woman

Description – Outgoing and opinionated, she is very comfortable expressing herself. Though she is not in a technical professional nor formally trained in computers, she is exceptionally comfortable around technology and is more than eager to offer suggestions related to ecommerce and mobile applications.

Participant P2: 28 years old American woman

Description – Friendly and talkative, she is an active shopper and appeared comfortable with purchasing through traditional websites. She describes herself as being someone

who is very comfortable purchasing products online from a website, but indicates that she is unsure of whether or not she is comfortable purchase through an online app.

Participant P3: 22 years old American woman

Description – She is very creative and expressive. She is full of ideas and eager to share them with the group. Though she is polite and attentive to other participants, she is forceful in communicating. At times, she can be very insistent. We believe she is the most active user in the workshop and she even describes herself as a “self-professed shopaholic”.

Participant P4: 40 years old American man

Description – He is quiet and reserved. From the beginning, he appeared to be more interested in observing the group than actually contributing to the group. His mood was pleasant and friendly. But, initially, it was difficult to determine his true interest and enthusiasm in app development.

Participant P5: 25 years old Chinese woman

Description – She is upbeat and enthusiastic to participate. However, it is clear from her comments that she does not routinely shop online. In fact, based on her comments, her shopping experience is limited by her income. She enjoys shopping and does purchase online – but she just does not have the same familiarity as some of the other participants.

Environment

We choose a big room with pleasant lighting. A big round table was positioned in the center of the room which provided enough space for participants to draw their ideas. Participants were required to sit around the table where they were facing each other. When people face one another it makes it much easier to communicate. But even more importantly, when individuals sit at a single round table everyone is equal to each other. At a round table, there is no obvious position of authority. It is a lay-out that is both comfortable physically and psychologically. It establishes a sense of democracy and equal power for all participants. Of course, democratic principles are a key component of Participatory Design. Everyone must feel included. The focus is on giving power to a group – not to a single individual.

In preparation, we printed 6 pages of sample interfaces which served a paper prototype.



Figure 8: The preparation of future workshop

The sample interfaces include: Home, Search, Cart, My Account, Login, Products. Pencils, color pens, white paper, scissors, tapes, and 4 colors of Post-It stickers were provided to support the brainstorming activity. The different color Post-It notes represent a modification from the Future Workshop. The Post-It notes were so successful during the Future Workshop that we wanted to make them even more effective (more expressive) and as such, decided to include different colors in order to be even more specific. A laptop was also provided in case we needed to search something online. And, to help establish a relaxed and comfortable atmosphere, we also provided coffee, tea and sweet cakes.

Schedule of Perspective work Shop

| Time | Work |
|-------|---|
| 13:00 | Start |
| 13:05 | Short Introduction and Ice breaking talk |
| 13:10 | Show all the participants the low-fi prototype |
| 13:15 | Everybody start to discuss the low-fi prototype |
| 13:25 | They stop talking and requested to throw new idea and put comments to the prototype |
| 13:40 | They reached a common conclusion and present it |
| 13:45 | They were requested to draw their own prototype |
| 14:00 | Finished drawing and start to explain their drawing. |
| 14:20 | End. |

Table 4: The Schedule of Perspective Workshop (July 1st, 2014)

5.2.3 Procedure description

Present situation

For preparation process, participants describe the current situation and problems ped by the topic, based on their own experiences.(Teknologi-Rådet., 2014) Importantly, to prepare for this step, we did contact the participants by email before the actual day of the workshop and asked them to consider the topic – which was how to create an effective Original Source mobile app. We wanted them to think about this topic before the actual workshop. We wanted to consider both the benefits and negative elements of an Original Source mobile app. To start the active discussion, we showed the participants images of the low-fi prototype. There were 6 individual pages, and 1 page with all the app interface. We encouraged them to sort through the pages, picking up a page to study more closely and observe the flow of shopping activity.

At one point, after viewing one of the pages, a user tried to ask me questions about one of the interfaces. We responded by politely telling her that we cannot answer. We explained that we did not want to have any extra-influence in the discussion. Everyone should develop their own thoughts independently. We told her that any questions could be addressed later in the workshop.

During this stage, we discussed the current Original Source website and we discussed the low-fidelity prototype. We talked about the possible advantages of using a mobile app over a website. We talked about the positive aspects of encouraging customers to shift to a mobile app. It was a discussion that addressed the larger topic of mobile app suitability for online buying.

Consequences

Consequences focus on the possible positive and negative consequences of the current printed prototype pages placed in front of participants (Teknologi-Rådet., 2014).

After 5 min, they were given a sign to start the discussion. The participants then started to engage in a discussion over the low-fidelity prototype. The flow of comments seemed balanced – many comments praised the prototype highlighting good parts and many comments criticized the prototype identifying parts that needed improvement. It was an active dialog. Some participants talked more than others. However, everyone participated. It was at this stage that everyone needed to be expressive and focus on specific details. The focus at this moment was on the impact of various components of the mobile app. The participants closely viewed the printed copies of the low-fidelity interface and started to think about and discuss the consequences of those design features.

For example – we discussed how the effectiveness of the low-fidelity search interface could impact the user. We discussed if the product page layout was exciting and visually stimulating to a user. We discussed if the *Cart interface* provided all of the purchasing and product information that a user would need to continue toward final payment. We focused on the consequences of all the previous design suggestions. The group did not discuss changes, but instead evaluated the impact and significance of the design features first proposed by the Future Workshop group.

The Future scenario

Participants produce positive and negative future scenarios which constitute the basis for round four (Teknologi-Rådet., 2014). During this stage, everyone was encouraged to be very specific. For this session, everybody is required to put comments on the paper prototype. They can choose different color of stickers, write down their opinions, affix on the paper prototype.

Everyone had suggestions to improve the low-fidelity prototype. Our approach was to have each participant first express the suggestion verbally (present a future scenario). One the participant shared the suggestion and idea with the group, he or she would then take that suggestion and either write it or sketch it on a Post-It note. The participant then affixed it to the printed copy of the interface.

The participants offered a wide variety of comments. Participant P3 was obviously very active, she started with praising this project, saying she really hope to use an app to shopping on her phone. Participant P1 said: “I’d like to put a heart symbol under the

product I like, then I could view them all at ‘my favorite’ in my account.” But more than that, I want to put my comments on the products after I tried it.”

She used her personal experience last year as an example. Previously, she did not pay much attention to comments before last year. But last year, she bought a hair dryer online. The product had a very nice picture and good product description. It was also priced well. The rating of this product also looked good. But 3 days later, after the product was delivered to her home, she found it is not suitable for her even though it is a nice product. Because she always worked late and came home late, she did not finish bath until mid-night. At that time, her baby had already fallen asleep. The problem was that the hair dryer made a very noisy sound causing her baby to wake up and start crying. So she had to return this product. Later on, when she opened the comments page of the products, she found some other customers had already remind other users of this noisy problem. If she could read the product comments first, maybe she would not purchase a wrong product. Even it is returnable, it still cost money (shipping fee) and a lot of hassle. The other participants all agree with her suggestion.



Figure 9: The Perspective Workshop

Participant P2 focused on the user account page. She was confused with the “\$” icon, and wanted to know if it represented the money you already spent, or if it represented the money you put in your account.

When she read about the Product Page, she said when she is looking at the enlarged pic, and read the description of the products, she also want to see some related products that would give her more choices. The related products would be something that is either similar in style or something that might serve as an accompanying accessory. Thus, if she clicks on a purse, she would then see other purses – along with smaller accompany accessories such as coin purses.

Participant P3 is the most active one, in addition to give some details, she gives more creative ideas. She is kind of shopaholic, she loves to buy things on line or in the shop, and she saves a lot of coupons in order to save money. She is already a heavy user of mobile on line shopping. She is completely comfortable with this technology. Her focus is on discounts. In her opinion, she believes that discounts should be offered as a key tool to motivate new users to try shopping no a mobile app. She believes that the Original Source mobile apps must offer a distinct price advantage as compared to shopping on the Original Source website. So she offers an idea that we should make “discount” as an individual tab – making it a much more important and visible part of the interface.

Participant P4 is the only male user in this workshop. He did not talk that much and was clearly more comfortable listening than talking. But he did appear to enjoy listening carefully and observing. But, as soon as he thought someone made a good idea, he would then immediately join in and offer support for that idea. He also would suggest ways to further expand a good idea from another participant. As a man, he does play online games, and he suggested features – which are popular in games – as possible additions to the Original Source app. When he heard Participant P3 raise the question on how we can get users to visit the Original Source app everyday – or at least more frequently, he immediately suggested the use of a reward program. Specifically, he said “we could design a small game called ‘rewards of login’”. It was a simple concept that simply meant that if users open the app and log in with their account number every day, they will get more points as a reward. The accumulation of the points can be used as money to spend on products.

His ideas made all the other 4 participants excited and they actually clapped their hands for him. It sounded very new to everybody and was given the full support of the other 4 participants. He was clearly encouraged by the others’ response and continued by saying “we could also make more features for this small game. We could let users earn more

points by finishing a task, such as 10 points for reviewing 5 new products per day. Moreover, users can gain more points by looking at advertisements.”

Participant P5 wanted to see top selling products. For her, she relied a great deal on ratings and on the popularity of a product before she began her own shopping. For her, opinions and recommendations of others was a very important part of her online shopping experience. She wanted the Original Source mobile app to make recommendations easier to find and read. She also continued her comments by expressing a dislike for the “wish list”. She believed that this was an unnecessary feature that would just lead to more clutter and possible confusion by the users. In her mind, a “wish list” means something user do not buy this time but prefer to save for next time shopping. She think that is the same as “my favorite” function. If users do not want to pay now, they can either leave this product in cart or try to purchase it next time, or add this product to “my favorite”.



Figure 10: The notes of low-fi prototype from Perspective Workshop

Later, the participants demonstrated consensus by all raising the topic of a discount tab (virtually at the same time). The idea was to create a new tab to present all the discount products on a single interface. 4 of the 5 participants agreed with the suggestion of creating a new tab. The 5th participant did not think a separate discount tab was necessary.

In conclusion, the participants reached agreement on several major design changes. These design changes included:

- 1) Making discount an individual tab. Present regular discount product and personal discount coupon
- 2) Add sign out function on “*My account*” page
- 3) Add related products on “Product” page.
- 4) Delete “Add to wish list”
- 5) Delete “Search by department”
- 6) Add more sorting function(sorting by price and name)
- 7) Add “write a review”

Perspective

Participants work on their own perspectives for moving from the current situation to the desired future one. Participants discuss the perspectives for future action necessary to achieve the desired development, and focus is also given to whether participants can make a concrete contribution to the desired development (Teknologi-Rådet., 2014).

While the previous phases of activity focused on group expression, the perspective phase is specifically focused on individual expression. The participants were asked to focus on their own thoughts – their own suggestions for completing the design. No longer were they asked to listen and accept the ideas of their fellow participants. At this point, they were asked to reflect and consider their own contributions.

Discussion is a part of the workshop, but again, the participants now focus on their future role in the design process. Equipped with their own suggestions and perspective, they candidly discussed how they each could support the future design implementation.

Participant P1 wondered aloud how her focus on product recommendations could actually help the design. Could she provide more examples and suggestions on how product comments could appear? She wondered if her desire to see highly detailed

product recommendations was shared by other users. She also indicated that she would be very willing to submit product recommendations for multiple Original Source products as this would add necessary content to the new app – making it more valuable to other users.

Participant P2 reflected and commented on the value and role of her suggestion. Her desire to see images of other products related to her selection could be an effective avenue to increase sales – or to “upsell” other products. Where before a user only buys one item, perhaps after seeing other products, that customer would buy something else. She believed in her suggestion though she was unable to suggest how she might be able to make future contributions.

Participant P3 remained very confident in the value of her suggestions. In her opinion, the active use of discounts was the key to driving increased traffic and purchasing. She continued to emphasize the need for an additional discount tab. In terms of future contributions, she felt that her idea contribution was powerful enough and valuable enough. In her perspective, her role was done. She had provided a particularly strong suggestion and now it was simply up to the designers to implement it.

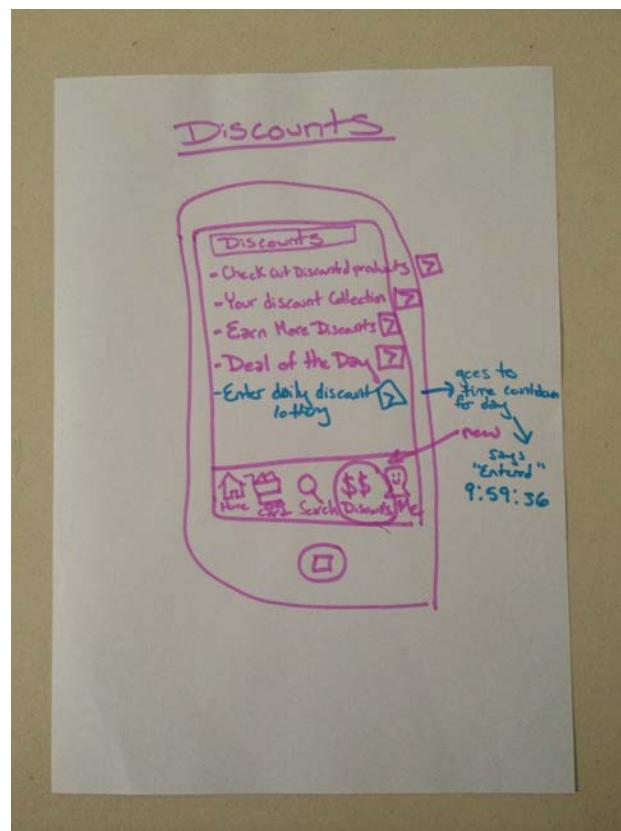


Figure 11: The paper prototype of Discount page drew by Participant P3

Participant P4 was far more vocal by this stage of the workshop. Where before he was quiet and observant, now he was talkative and assertive. His suggestions to incorporate features of online gaming into the Original Source mobile app were very well received by the other participants. The response from the others inspired Participant P4 to assume a much more authoritative role. He continued to speak and share his perspective on how adding a fun game element to the app would certainly increase visitation and buying. In terms of future contributions, he eagerly expressed how he would be willing to remain in contact with the designers offering many other game-based suggestions.

Participant P5 reflected on her suggestions. She was less vocal and more reserved with her perspective. She repeated the value of telling users about the top selling and most recommended products. She remains focused on communicating the value of product popularity to other users. She also remained firm on her belief that the wish list was unnecessary. Reflecting on the future, she enthusiastically indicated that she would be more than happy to share her opinions on future prototypes of the app. She was eager to help.

5.2.4 Summery of the Perspective Workshop

The workshop was successful in helping to advance the design of the Original Source mobile phone app. The key results of this workshop were recommendations for the new features to be implemented further in the high-fidelity prototype. The creation of an effective and improved high-fidelity prototype was enabled by results of this workshop.

The decision to use a perspective workshop enabled us to have an effective and highly-detailed discussion of the technological process. A perspective workshop is ideal when evaluating weaknesses and strengths of a particular technology as it creates an environment that can handle multiple and diverse suggestions. This form of workshop does not need common-ground among its participants at the beginning (Teknologi-Rådet., 2014) . And, its use of presenting suggestions through multiple written notes is ideal for evaluating a challenge where everyone is expected to have a high number of suggestions.

The participants were active and eager to contribute. We observed how their personality styles often seemed to influence their design suggestions. We observed how their demeanor and personalities would change depending on how others responded to their suggestions.

In the end, a consensus was reached. The perspective phase at the end did serve to reveal more about their personalities with some participants expressing an ongoing interest to contribute while others seemed to be very self-satisfied that their contributions were

already enough. The input obtained for the high-fidelity prototype was significant and ensured a far more capable and complete design as compared to the low-fidelity prototype.



Figure 12: The paper prototype and notes provided by participants by participants in Perspective Workshop

5.3 Semi – structured Interview

5.3.1 Introduction

During design process of Original Source app, we gathered basic information about our users through the use of a questionnaire. We then continued with a future workshop which contributed to the creation of a low-fi prototype. Using a perspective workshop, we then gathered more detailed insight on the proposed mobile app, resulting in the design of the high-fidelity prototype. Now, it was time to fully evaluate the high-fidelity prototype. A well-prepared interview is an effective tool to gain a better understanding of the strengths and weakness of a hi-fi prototype.

We made the decision to utilize a semi-structured interview. We felt that a structured interview would be too limiting and not allow us to explore new insights when they were shared. Moreover, we felt that an unstructured interview might allow too much flexibility. The semi-structured interview was used with an expert from the Original Source company, a person who is very familiar with all the company's web-applications and their development. Thus, the person had more knowledge and expertise than us on all key aspects of the e-commerce and the technologies to support it. In addition, this person also uses existing web application as a customer, for all her shopping needs that the Original Source can satisfy.

5.3.2 Choosing Interviewees

Many authors would agree that a stakeholder who is affected by the use of the application is one of the best choices. In this case, we have conducted the in-depth interview with the expert (and the user in her private life) first, but as part of the usability test described later in this thesis, also with users, people for whom the application is made.

Lazar claims that “in some cases, stakeholders may not be users at all. For any reasonably complex system, you can expect that different group of stakeholders will have very different perspectives on requirements, necessary functionality and usability

“(Lazar et al., 2010, p. 188). In our case, we were lucky to have both an expert and a user in one person.

In our Original Source project, we have gathered more information from light users (Future workshop) and from heavy users (Perspective Workshop), in order to create an overall better product and service-level for “buyers”. But the opinion of the “sellers” who worked in Original Source Company is also important for the 3 reasons as below:

- 1) An employee of Original Source may have access to key company information. This person could have first-hand knowledge of all purchasing and sales activity within the company – far more than any user.
- 2) An Original Source employee would also bring a different perspective to the interface and function.
- 3) It is important that an e-commerce application should both work well on buyer side and user side. As such, an employee's input is important to create a balance between a buyer's input and a seller's input.

5.3.3 Question Design

“Interviewing in searching of requirements requires an appropriately broad and open-ended view of the possibilities” (Lazar et al., 2010, p. 184) So, we should not ask narrow questions or yes-or-no questions. It is better to make the interviewee think broadly in order to encourage greater detail and description.

A good question design can help HCI designers gather more requirements. The answer should be easy to evaluate. When we design the interview questions, we focus on the following aspects:

Design style – Does the design style match and support the products they sell?

Interface – Does it show everything clearly?

Function – Are those functions are useful?

Then we developed 6 questions.

5.3.4 Preparation

“In order to help you find questions that are hard to understand, pilot testing can give you some idea of the potential length of an interview” (Lazar et al., 2010, p. 197). We wanted to confirm that my questions were clear and we also was interested in observing how an interviewee would respond. As such, we conducted a pilot test of my interview questions with a master’s student in Human Computer Interaction. All of the questions were reviewed. The student was a native English speaker, and thus could give some suggestions about English grammar and how to choose appropriate wording of questions. The student was particularly helpful in uncovering where we had too many structured, close-ended questions. “Structured, close questions limited users to a small number of pre-defined choices.” (Lazar et al., 2010, p. 194). The student was also helpful in discovering some leading questions as in the following example: “Is this interface effective?”, was changed to: “can you tell me what you think of this interface...?”. Thus, the pilot test was very helpful in interview preparation.

5.3.5 The interview

We call the e-commerce manager of the Original Source Kitty. She has 2 years work experience and is responsible for managing all aspects of the Original Source website. She has several individuals who report to her. In her role, she is responsible for creating marketing strategies to build e-commerce sales. Though, she has assistants who help with the design and functionality of the website, she is ultimately responsible. For the sake of the interview, it was very clear that she was a key stakeholder.

As an individual, she is a very creative person who is passionate about her career. She is eager to share ideas and holds strong opinions as to her vision for building OS business.

We began by giving her an introduction to the project. We shared comments about our long-term goal. We shared background on our past activity. We then showed her the high-fi prototype, and we gave her as much time as she needed to read and study it. She spent about 10 minutes to carefully review the prototype on the computer. After she was done, she looked at us and smiled and said that she liked the design. While we were naturally encouraged, we also recognized that we did not want to her give her questions that compelled her to only give supportive comments. We wanted unbiased, clear and honest critique.

Questions to Kitty follow. The answers are presented as direct quotes from Kitty.

Q1: What do you think about the high-fi prototype? Give us an overview of your thoughts..

Answer: "I like the design style, it is very artistic. We are a company selling giftware. We need to convey the sense that we have a good eye for style and design. We want to appear contemporary and sophisticated. Overall, I think the design is elegant. It is clean and simple – which gives it a modern and sophisticated feel. And most importantly, the focus appears to be on the products. The products are very visible. The products are easy to find. When I look at this prototype, I immediately realize that this is an app which is promoting beautiful products. It truly highlights the products."

Q2: Do you find this interface easy to use? If no – why? If yes – why?

Answer: "Yes, I believe the interface is easy to use. The lay-out and design is clear. I do not like cluttered interfaces. I prefer a minimum amount of navigation markers – a minimum amount of text – the focus should to highlight the products. I also believe that a good interface is intuitive. The user should not question how to use the app...it should really just be intuitive and natural. This interface looks clear and easy to use."

Q3: Are any parts of the interface particularly useful or helpful ?

Answer: "The product page. I really like the way it emphasizes and highlights the product with big pictures and just the right amount of text. Original Source has one focus and that is to sell product. We like to use the phrase 'romance the product.' This means that we try to make the product look beautiful and sound beautiful during our marketing activity. This product page does a nice job at 'romancing' the products. The photos are big and it is nice to see 3 other smaller photos of related product appear alongside the primary product. This is a strong part of the interface because it is very effective in accomplishing its goal – which is to make someone purchase a product. I also really like the rating and review part. That is an important part of the selling process."

Q4: Are any parts of the function particularly useful or helpful?

Answer: “I like the design of “My account”. This is a good place for customers to manage information related to their current order and their account. From my perspective, the more control we can give to our customers over their orders, the less money we have to pay in customer support resources. We would always prefer that a customer can track their own packages from their mobile phone app instead of calling our office and taking the time of an actual customer service representative. We can save a lot of money by having a ‘My Account’ function that is effective.”

Q5: Do you see any problems or weaknesses in the interface?

Answer: “Well...I do like the idea of a mail system in the ‘My account’ page. But, I do want to know if the mail system is only for users to exchange mail with the store?”

At this point, we answered and told her that the present design only allowed for emails to be exchanged between user and shop. She continued:

“So, I cannot send to other users. First, I do think communication among users would be very helpful and appreciated. But, instead of doing this by email, I think a message system is more appropriate and effective. After all, emails can have a very formal connotation whereas a message is shorter, lighter in content and usually more casual. I don’t think users need an email system among them, but a message system could be very beneficial and popular. I think the connection among users would enhance their online shopping experience with OS leading to more frequent visits and purchases. The message system will help create a sense of community among the users. It will facilitate a sense of shared interests.”

Q6: If you were asked to make one change or add something new, what would you change or add. ?

Answer: “I have a lot of crazy ideas that I would love to see added to a shopping app. Because I have a secret love of computer gaming, I am always trying to find a way to make online shopping as fun and exciting as computer game. Therefore, to start, I would want to build-in a point system on the app. I would want to introduce several small games on the site that would make the experience much more interactive for the users. For example, users could earn points for the length of time using the app and could earn additional points for the amount of product they purchase. The more time spent on the app or the more product purchase, the more points. We might even have fun questions pop-up on the app regarding our products. The right answer would result in more points. Of course, these points actually serve as a type of discount. Collect more points and gain access to product discounts or even shipping discounts. Oh...and I do have one other important idea. Many of our competitors use a program called ‘Deal of the Day’ where a big discount is offered for only 24 hours. The discount is for only one product and only lasts 24 hours. This type of discount creates a lot of good tension and pressure to buy. I

would want this design feature to highlight one great product that would be discounted at least 50%. I would want the ability to announce a ‘Deal of the Day’ with product photo. We presently offer many discounts but these can be costly. For our current discounts, we often find ourselves printing flyers that are then distributed in our packages. Or we need to pay a designer to create an online flyer that is then sent out to thousands of users. If we can announce a ‘Deal of the Day’ thru an app, we can save a lot of money and time.”

5.3.6 Analyzing the Data

When finished, we believed the interview was productive. We felt that Kitty had provided candid, clear and helpful answers. But, we also realized that her feedback required much more analysis.

“...the analysis of answers to individual questions are combined to form general models of user needs for a particular task, reaction to a proposed design, or other focus of the interview.” (Lazar et al., 2010, p. 206)

We clearly wanted to first evaluate each answer individually, and then look upon them together to see if we could identify patterns or common themes. One immediate observation was that Kitty’s answers were characterized by enthusiasm and extensive content. Her enthusiasm and eagerness to express herself, could create an impression that we were looking for compliments – that we were encouraging pleasant and supportive feedback. We did realize at this point that her extensive answers were a direct reflection of our semi-structured interview process. We did not approach her with close-end questions, rather we used open-ended questions that would encourage her to continue her expression.

Having recognized the impact of her enthusiasm through the length and content of her answers, we now wanted to look more closely at the actual meaning of her words. What was she telling us? Were their connections between her answers, were their similarities and recurring themes that would allow us to gain greater insight.

“One technique that is commonly used for analyzing data involves examination of the text of the interview for patterns of usage, including frequency of terms, co-occurrences, and other structural markers that may provide indications of the importance of various concepts and the relationships between them.” (Lazar et al., 2010, p. 208)

Our goal was to maximize the value of her suggestions. As such, we wanted to look beyond her words and understand her values and true goals. We believe this focus would help the design process.

Looking more closely at her answers, we did find two instances where word frequency and co-occurrence revealed her priorities. Specifically, in terms of word frequency, we noted that in 3 answers, she used the phrase, “highlight the product.” Kitty appeared to be focused on interface features that made the product both visible and appealing. In 3 instances, she complimented how the prototype made the product more attractive to the user and therefore, more likely to sell. We concluded that Kitty was indeed a stakeholder in the app. As the person accountable for all e-commerce at Original Source, Kitty was motivated by features that would improve sales.

In terms of co-occurrence, we determined 2 instances where she concluded that a particular feature would result in a company-wide cost savings. The co-occurrence was her identification of two features that would allow the company to reduce a particular expense. In the first instance, she points out how a more effective “My Account” interface would allow users to track their own package thereby eliminating the need for costly customer-service phone reps. Then, this focus on cost-reduction occurred a second time when she concluded that a discount offer provided through the mobile app would allow Original Source company to reduce costs. A discount that is announced through the app would eliminate their need to pay for printed advertisement that are inserted into the outbound packages. It would also reduce their expense to have someone create a PDF that is emailed to users.

The interview was productive. The majority of design features were accepted and supported by the interviewee. Her feedback was extensive and enthusiastic and focused on how Original Source could use the app to build sales and improve the purchasing experience for their users.

Chapter 6

Making a Prototype

6.1 Low-fidelity

The main focus on the Future Workshop was to create a list of design features that we would want to see on the Original Source mobile phone app. The end result of the Future Workshop provided us with our desired features. Thus, the next step was to take these design features and use them to build our first low-fidelity prototype for the OriginalSource.com app. We used the notes and drawings made during the Future Workshop as our starting point.

Based on the results of the future workshop, we have developed a low-fidelity prototype. The prototype has four basic categories: Home, Cart(Shopping cart), Search and Me(My page)

6.1.1 The low-fi prototyping of Original Source app

The primary interface was established through an agreement among all of the participants – with the exception of one. Our Participant F2 is the young student who is characterized by being very creative, stylish and tech-savvy. He sketched a complex interface design that was far different than a more traditional shopping app. But, as we all discussed, our user base averages in age from 20-40 years old. As such, we all agreed to a more traditional shopping app design and created 4 tabs:

Home Page

“Home” refers to the Home page of this app, and it is the first screen viewed when users open this app. We decided to keep a space for the placement of a banner. 3 popular products are presented, and if the users want to see more popular product, they can easily slide over to view more. Importantly, during the future workshop, each participant complained about confused categories. The separation of products was not clear and easy to understand. We addressed this by creating product-departments – groupings of similar products. Before viewing an individual product such as a purse or tea cup, the user would view product categories such as women’s accessories or tea ware. This of course would provide the user a more controlled interaction. The user would not be floating among so many unrelated products, but would instead be brought to a category of similar

products. Thus, we want the user to first choose the department before they start to shopping.

Search Page

When customers type in key words about the products they are looking for, a group of related products will appear in a list. In the future workshop, participants wanted a sorting feature to use with the products. There are different ways to sort depending on the preference of the user. If the price is the key determinant to the purchasing decision, then the user can sort by price, from low to high or from high to low. If product quality is the primary concern, a user can sort it by rating rank. The default sort is sorted by name (alphabetically – a to z).



Figure 13: Low-fidelity prototype of Home page (left) and Search page (right)

Product Page

When a user clicks “Buy Now” button, it will redirect to a purchase page. When the user wants to continue shopping for more products before purchasing, they can do this by clicking “Add to Cart”. When users are not sure if they are going to buy a product at this time, but might potentially purchase in the future, they can “add to Wish List”

Cart Page

When users are ready for check-out or if they want to review their selection, they can switch to the “Cart” tab. All the information of a product is listed, on this page including picture, price, and quantity. The money is automatically calculated.



Figure 14: Low-fidelity prototype of Product page (left) and Cart page (right)

Me Page

When people play online games, there are common and popular features of the games which tend to heighten the enjoyment of the overall gaming experience. Some of these fun features include the use of your personalized avatar photo – along with an email box to exchange dialog with other gamers. Many online games also include a “bank account” to manage virtual currency. Rankings are another popular feature where your rank increases the more you play. And, the higher the rank, the more access you have to unlock and use other game features. These gaming features are mentioned here because one of our participants (Participant F4) is an avid game player and he introduced the concept of transplanting certain game features to an online shopping app. Though this may seem like a very different approach, our group did believe it had merit and was worth considering. So for the low-fi prototype, we incorporate a cycle of changes that included traditional features from an online game:

Avatar – A real photo or cartoon is available to the users.

Rank – Regular and VIP. The more a user shops, the closer they will become to earning VIP status. VIP status will give the user access to special discounts and product offers. A user can also buy VIP membership.

Currency – User can deposit money into their currency account, when they return products, the refund will be returned to here or the credit card.

Email box – An effective and convenient way for the user to maintain communication with OriginalSource.com. Original Source can also initiate contact by sending product updates and special discounts. Users can also send emails to each other.

Fasting Tracking – It is an individual tab about personal account information. Every operation related to the individual user will be done here. According to the internal report of Original Source, 30% of the customers’ phone calls are questions about tracking a package. Very often, customers will call when their order is not received on a designated date. In some instances, packages are delivered but may be misplaced within the location of the customer (such as lost in the mail room or sample room). As such, all of us felt very strongly that users must be given the ability to track their package through a smartphone. In an addition to having the ability to initiate your own tracking, we want the app to also offer an automatic update (push-up function) that will inform the user when their package is delivered or if they is some problem – such as an incorrect address. Thus, tracking activity with our mobile app is both automatic and under the control of the user. They have a choice.

Other important design features were added to Me Page during the low-fidelity prototyping. These additional features include:

My Order – User can view the order history through "My Order"

My Favorites – Users have the option to tag and remember favorite products for future visits to the site.

Browsing History – During future workshop, some users expressed an interest in viewing their browsing history to give them a reference on what they viewed last time.



Figure 15: Low-fidelity prototype of My Account page

- Gift Certificate – A gift certificate is an effective tool to promote both wholesale and retail purchasing. If a user has received a gift certificate from Original Source, that certificate will be visible and confirmed on this screen. This will be a helpful and convenient method to reward customers and to encourage additional purchasing activity.
- Account Setting – This provides the basic function for setting up password, changing photos.

Ask for Help – When user clicks here, a phone number will pop up that provides direct access to a customer service help-line at Original Source

6.2 High-fidelity Prototype

6.2.1 The High-fi prototyping of Original Source app

The biggest change between the low-fi prototype and high-fi prototype is the addition of a new button – the Discount Button. This change originated from the workshop. Most of the users insisted on adding discount as an individual button as they believe it would be an effective tool to increase the frequency of use among users. Knowing that new products were always being added to the discount section would provide a temptation for users to return to the app on a frequent basis.

As we continued to evaluate the data from the workshop, we concluded that the high-fidelity prototype should have 5 buttons: Home page, Category & Search, Discount, Shopping cart and My account.

Design – As we began the process of designing the interface, we kept in mind that Original Source existed to sell quality stylish gifts. They focused on creating a brand image that was characterized by elegance and trendiness. And, we realized from the questionnaire that their target market of users were generally young professionals. All of this background information would have significant impact on our design decisions.

Home Page

The home page is divided into 3 parts:

The top part is a banner advertisement featuring the new season's collection. As compared to the low-fi prototype, we deleted the "search by department" function since users suggested that we could combine "category" function with "search" function together.

The middle part is reflected key recommendations from the products group, such as new product, discount product and popular product.

The lower part reflected a display for standard and regular products. It will randomly present products from the product database though generally, the products that appear in this section would be among the top-rated products or new products.

Category & Search Page

When users are looking for products, they want to have more options to select from. As such, we kept that category list positioned on the left side bar. Users have choice to either look for product by category, or search from the whole database.

If some products are on sale, the discount tag will also be shown with the products

Another new function suggested by the users is sorting of the search results. There are 3 ways to sort: 1) By name (A to Z) 2) By product rating and 3) By price

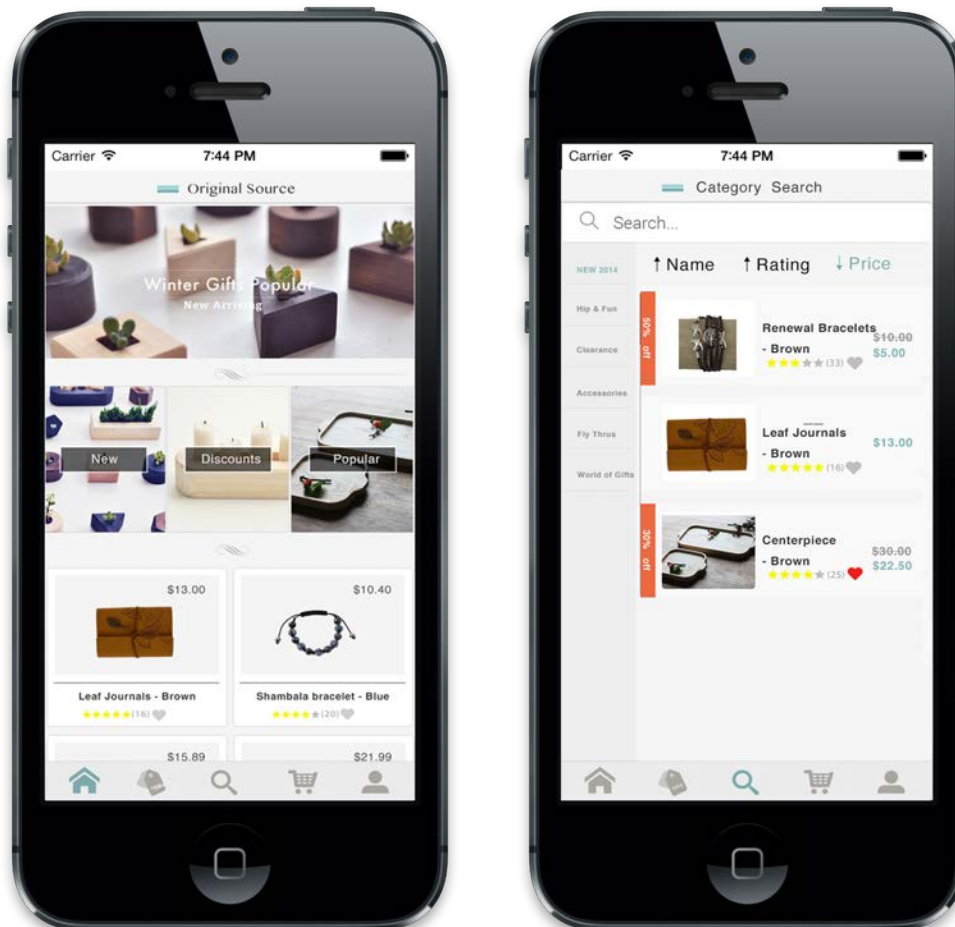


Figure 16: High-fidelity prototype of Home page (left) and Category & Search page (right)

Discount Page

One of the most significant changes that was suggested during the workshop was the creation of an independent discount page.

The page is divided into two parts:

Top Part – A presentation of current discounted products.

Bottom Part – A presentation of all discount coupons which are available to the user at this time.

Cart Page

This interfaces will reflects all products that have been selected by the user and add into the car. Importantly, the quantities of the products can be changed on this page.

We positioned the “pay now” button on the top because this would allow users with large orders to avoid the need of scrolling down the screen to reach the bottom in order to confirm the total value of their order. It will now be easily visible at the top of the page.

We also added an obvious indicator that reflects how much money the user has saved on this order.

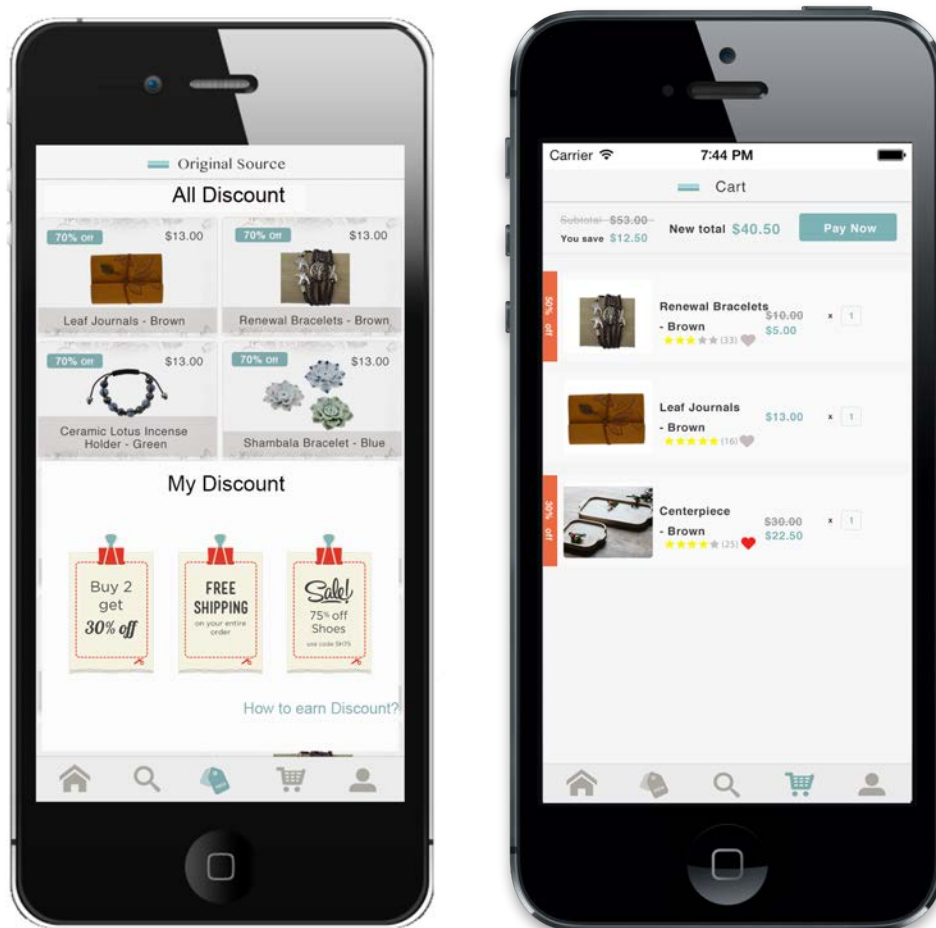


Figure 17: High-fidelity prototype of Discount page (left) and Cart page (right)

Product Page

We continued to make changes according to the data we gathered from workshop.

1. Underneath every product image are 3 relevant product suggestions. If users want to see more products, they can press "<" and ">", slide from left or right.
2. We describe the products using traditional marketing language. Our focus is on short descriptive text that gives a basic introduction along with compelling descriptive words.
3. Ratings – We made this as prominent function to encourage interaction between seller and buyer. Every buyer is given the ability to rate the products – giving other buyers insights on whether the product is good. In addition to the actual ratings, buyers can also provide a written review which can offer much more detail about the product. Our participants thought the rating feature was particularly important, helping buyers make good decisions and helping sellers determine which products to offer and which products to cancel. Over time, this rating function will literally purge the app of low-rated products and create a concentration of higher-rated products. It is a very good way to develop E-commerce.
4. A heart button was added that serves to designate a product as a favorite. Users can press this button and the result will be that the product is added to their favorite list.
5. We also offer 2 ways for shopping. Users can press "Buy now" which will direct them to the cart page to complete their purchase. Or, if users want to continue to shop for more products, they can press "add to cart", then there will be a small number "1" shows on the cart icon and they will be able to continue their shopping.

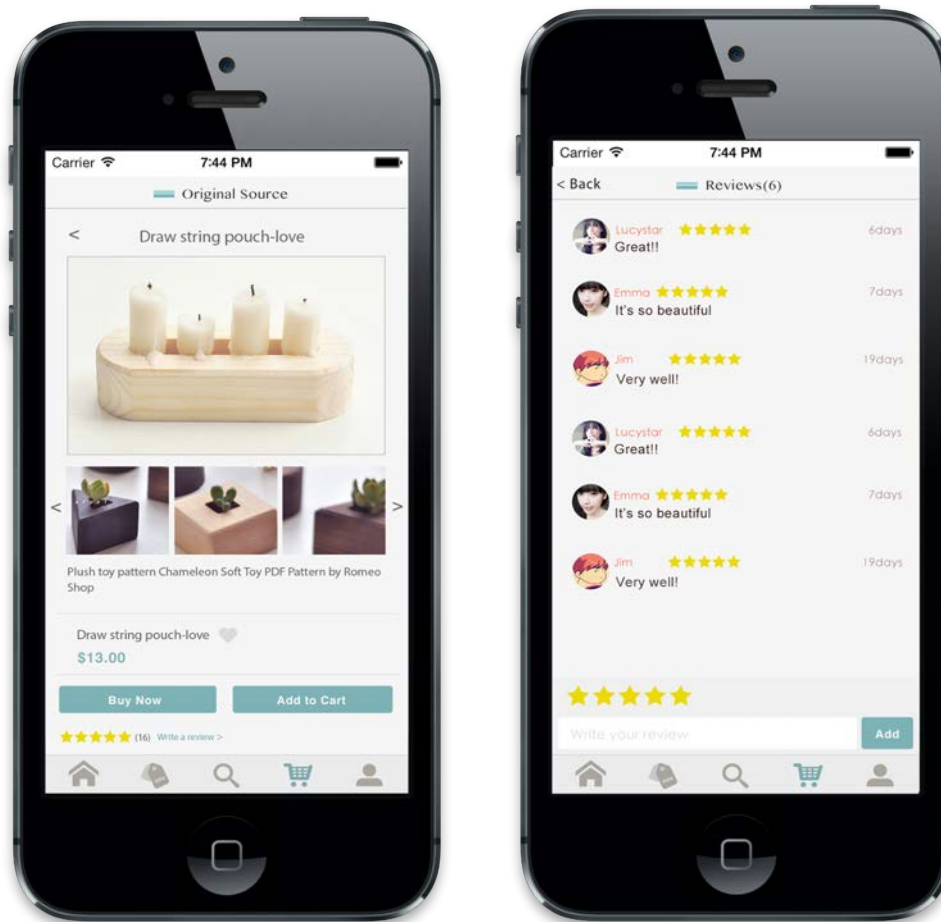


Figure 18: High-fidelity prototype of Product page (left) and Review page (right)

My Account Page

My account is a place for users to organize their specific account-related information.

We created a profile for each user that includes a photo and identifies whether or not the user is a VIP user or a standard user.

On this interface, the 700 means this user has accumulated 700 points. These points are collected automatically through purchasing activity through this app. These points can be used as “money” to purchase additional Original Source product through this app. The account will also reflect when a free point coupon is distributed to the user.

This interface also provides a messaging service. Users will receive messages from the Original Source shop and will be able to respond to the shop through messaging. Users will also have the ability to exchange messages with other users through this system.

There were other aspects of the design that were not changed. These parts were not criticized by the participants and were therefore retained. The unchanged parts include: Fast Tracking, My Order, My Favorite, Browsing History, Gift Certificate, Account Setting and Ask for help.)

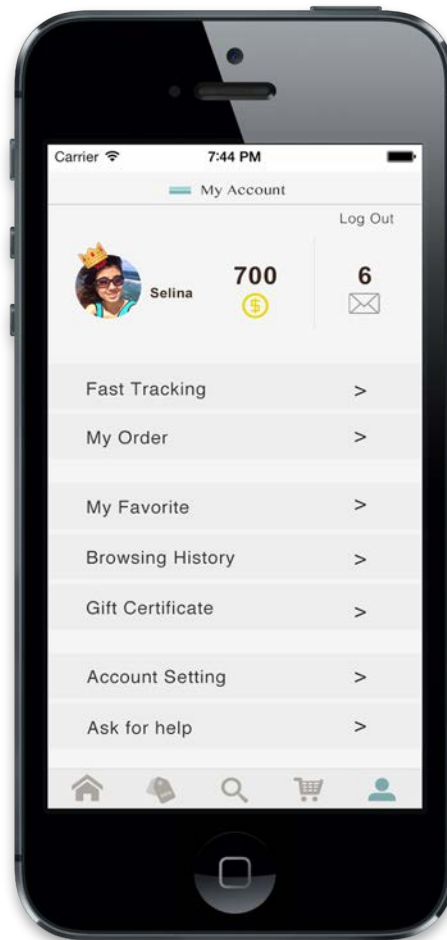


Figure 19: High-fidelity prototype of My Account page

6.3 iPhone application demo

Home Page

We keep the interface design of high-fidelity.

Category & Search

We keep the interface design of high-fidelity, but according to time limitation, we can not finish “sort” by price, name and rating.

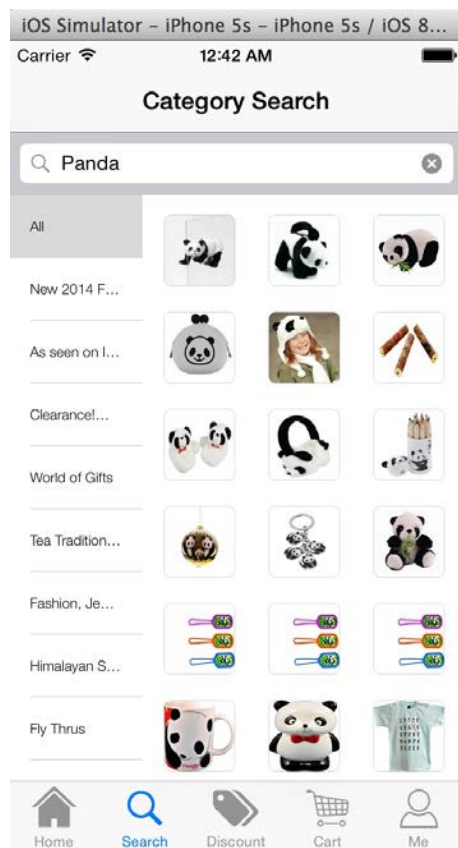
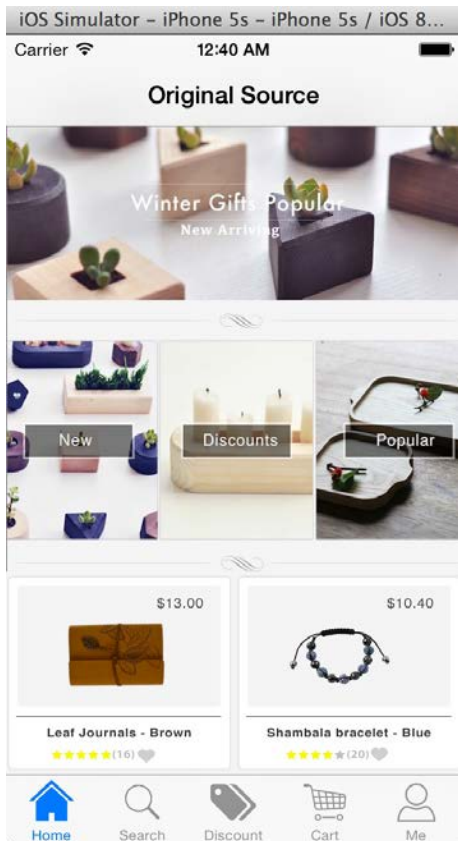


Figure 20: Demo of Home page (left) and Category & Search page (right)

Discount Page

The biggest changes of Discount, is made from Kitty's suggestion. "My discount" is moved to "My Account" page, "New Discount Special" is moved to the bottom of the interface, we put the "Deal of Day" product with a count down clock at the top of the striking place.

Cart Page

We keep most of the interface design of high-fidelity.

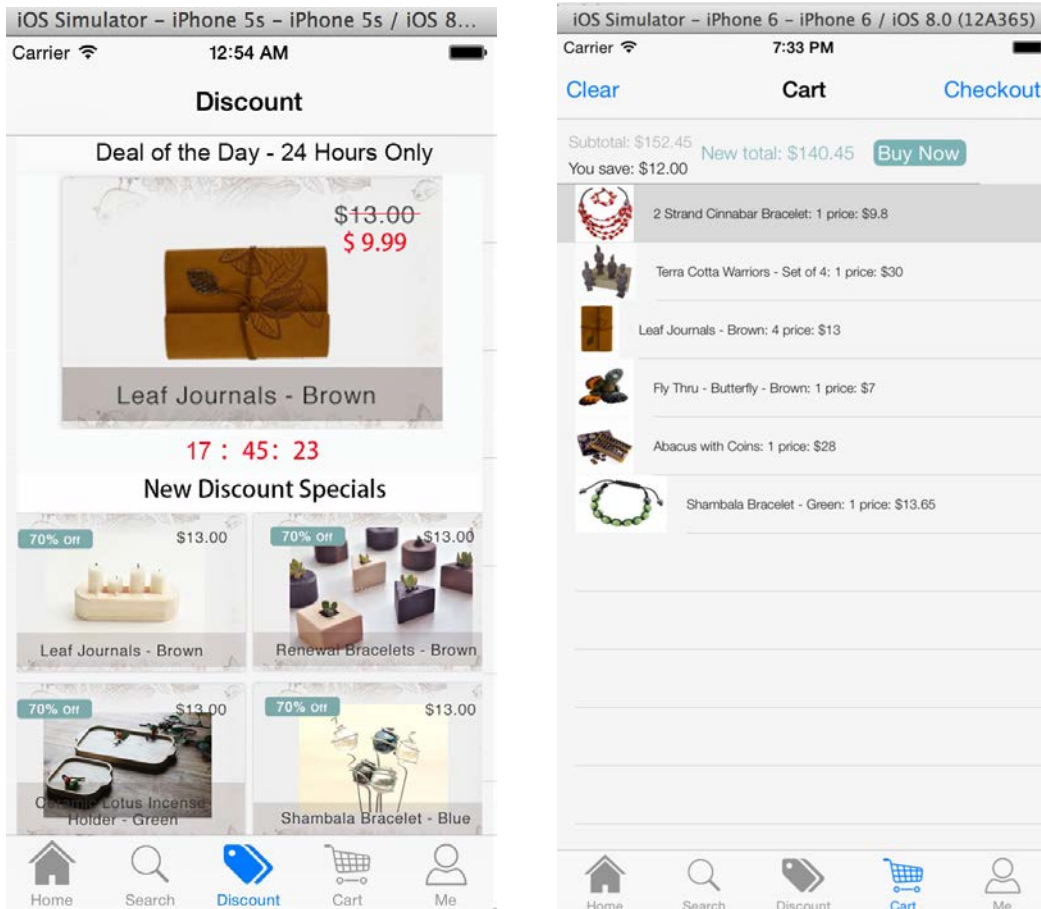


Figure 21: Demo of Discount page (left) and Cart page (right)

Product Page

We keep the interface design of high-fidelity.

My Account

We keep most of the interface design of high-fidelity, but change the “mail” icon into “message” icon according to Kitty’s suggestion in semi-structured interview.



Figure 22: Demo of Product page (left) and My Account page (right)

Chapter 7

Usability test

7.1 Purpose

The purpose of a usability test is to improve a device by finding its flaws. By uncovering flaws – by revealing weaknesses within a piece of technology – we are then in an ideal position to improve it.

7.2 Stage of usability testing

There are different way to conduct a usability test, for this project we choose a stage from Rubin and Chisnell (Rubin and Chisnell, 2008):

1. Develop test plan
2. Set up the test environment
3. Select representative users
4. Prepare test materials
5. Conduct the test sessions
6. Debrief the participants
7. Analyze data and observations
8. Report finding and recommendations

1 Develop test plan

The plan for our usability test was to observe how the users would conduct representative tasks on our interfaces. Specifically, we were focused on the ease by which a user could finish a task. Clearly, we wanted to see if the user became stuck during a task. We wanted to see if the icons and navigation were obvious and easy to use. If the user failed to finish a task or if it took too long, then this would mean a flaw existed and we would need to improve it.

Since we are developing an online shopping app for Original Source, our focus is on developing a clear and effective shopping process. We described this shopping process with the following list of representative tasks:

1. Find any product (depends on the users preference)
2. Find a panda toy
3. Find a discount product
4. Add 3 products to cart and check-out (without any payment)
5. Add a product as my favorite

6. Write a message to the shop
7. Call customer service

We believed that the tasks listed above provided a comprehensive and thorough evaluation of the key features of the interfaces.

2. Set up the test environment

We selected a large room with comfortable lighting and a comfortable chair. One of our concerns is to make sure our room did not feel too much like a classroom. When people shop online, it is usually done in the comfort of their home or even at the desk at work. Online shopping is not generally done in a classroom. As such, we did not want our participants feel as if they were sitting in a laboratory – being “tested.” We wanted them to feel as relaxed and natural as possible. We placed a laptop on the table. We did select a room that had had a large window that gave us a very clear view of their activity. The laptop was position to allow us to monitor the participant’s movement and interaction with the interface. The participant sat next to the window. Thus, the participant was in a comfortable room that in some ways reflected a home environment without distractions and positioned for our observation.

3. Select representative users

We selected 3 users – comprised of 2 females and 1 male. They are all customers of Original Source. Each has expressed enthusiasm with the idea of an OS shopping app. Each is eager to participate in the usability test.

User U1:

Gender: Female

Age: 30

Occupation: housewife

Nationality: American

Type of smart phone: iPhone 4s

Have you ever shopped by smart phone app: Yes

Frequency of smart phone shopping: occasionally / 2-3 times per month

User U2:

Gender: Female

Age: 23

Occupation: student

Nationality: Chinese

Type of smart phone: iPhone 5s

Have you ever shopped by smart phone app: Yes

Frequency of smart phone shopping: Frequently / 5-10 times per month

User U3:

Gender: Male

Age: 34

Occupation: self-employed / sales

Nationality: American

Type of smart phone: Samsung S4

Have you ever shopped by smart phone app: No

Frequency of smart phone shopping: Never

4. Prepare test materials

Since the app is just demo, we decided to use an iOS simulator from Object C instead of using a real iPhone. By using an iOS simulator, we were able to monitor the participant's movement and interaction on the interface remotely. We did not need to stand over the participant and attempt to watch on a small phone screen. We were able to observe the activity on the simulator as we sat on the other side of the window. This set up was effective. The window allowed us to observe their body-language while the simulator allowed us to observe their interaction with the app. We also used a stopwatch to record the time required for various tasks. And, in addition, we used a software called Screen Flow to record the participant's activity on the screen. By recording the event, we could go back and review it multiple times making sure we observed everything.

5. Conduct of the test sessions

The test was conducted one by one, each test was given 10 min to conduct. When one participant was doing task, the other was rest in another room, drinking coffee and eating snacks. There was no interaction between the participants during the actual testing process. Moreover, we insisted that the participants do not discuss any aspect of the test among themselves.

Usability testing of U1

Key Observations:

- 1) User U1 entered the testing room and was given a piece of paper with 9 tasks listed.
- 2) She took 3 minutes to read the task list before she started.
- 3) She then spent 1 minutes looking through the entire interface – and then, she click on the discount banner which is located between “New” and “Popular.” It was noted that she clicked on the Discount Banner and not the “Discount tab”.
- 4) She quickly look through the whole discount and clicked “pink cup”, then added to her cart. So she finished the task c very quickly.
- 5) Then she went back to home page, and clicked the “leaf Journals-Brown”, and added to cart. She finished task a very fast as well.

6) For task b – find “panda toy”, she went back to the main page, and clicked “search” tag, instead of typing panda, she choose to click different tab on the left one by one, and try to look for “panda toy” tab by tab. It took her 2 minutes to find, but at last she found it in “Kids & Young category.”

So now she had already finished task a – d

7) For task e, she clicked “Cart” button, choose “panda toy” . She click the red heart and added “panda toy” as her favorite

8) For task f she clicked “Me” button, and looked through the list. She clicked every menu, especially the “Gift Certificate” and she clicked “ask for help”, to find out how to call customer service.

9) Now just task h left, she switch from different pages, and it took her 1 minute to find. Finally, she stop at “Me” page, and seems like she was not sure if the “message” icon is the task h, she stopped for 2 minutes but then click the “message” icon, and it worked, so she smiled.

- In total, she spent 7 minutes to finish all the task.

Usability testing of U2:

Key Observations:

1) It was immediately obvious that U2 was very familiar with online shopping.

2) She took just 1 min to look through all the task list, and she then opened the iOS simulator.

3) Her approach was different than what we expected. She immediately started to click all five buttons (Home, Search, Discount, Cart, Me) in an effort to gain an understanding of the basic function of each.

4) She then clicked the “Search” button and typed in the words: “panda toy”. She quickly found her designated product and added it to the Cart.

5) She then clicked the “Discount” button and selected both the “Heart Box Set” and the “Dragon Ring” and added to the Cart.

6) Because she has already quick glance over the 5 button page, so she find how to call customer service very quick. For the task g - writing a message, she click “account setting”, but it seems like nothing to find, then she go back to “Me” page, and realized the “message” icon is what she need, and finish task g

- In total, she spent 3 minutes to finish all the task.

Usability testing of U3:

U3 is fairly unique in that he has never purchased anything on an app, and he has never used an iPhone before. But he is interested in this usability testing. He spent 2 minutes looking through all of the questions carefully, and he then started to do the task list.

- 1) He first clicked “New” and “Discounts” and “Popular in Home page. It appeared as if he wanted to see as many products in a short amount of time.
- 2) He then clicked the “Leaf Journals – Brown” on the Home page, and added it to the cart.
- 3) Then he click Search page, and type in “Panda toy” and found this product very quickly.
- 4) Now he realized that he needed to add a discount product, so he started to type in “discount” on the search page.
- 5) When he found that he cannot search anything, he deleted the typing “discount” and typed in “on sale”. Of course, he still cannot find anything. So he stopped for at least 30 seconds. He then finally found the “discount” page, selected the “Dragon Ring-3D” and added it to the cart.
- 6) Then he clicked on the “Me” page and found the “message” system easily. And he also quickly found the customer service feature. It is a little bit surprise that he can finish all the task smoothly and fast, even though he had never shopped on an app before and had never used iPhone.

- In total, he spent 6 minutes to finish all task.

6. Debrief the participants

At the summary of the usability test, it was time to debrief the participants. We made the decision to speak to each participant individually. We did not want the participants to hear each other’s comments. We created a set of questions to use. The key focus of the questions were to uncover the flaws. We did not want to guide or influence the participants, but we did want to ask questions in such a way as to make them think about the problems – the areas where the app could be improved.

Before starting the questions, we communicated the following statement to each participant:

“Thank you for participating in our usability test. We appreciate your time. Now, we want your critique. You may think that our app is already good. But, we want you to carefully evaluate what you just did, and we want you to provide as many criticisms as possible. We want you to focus on “the bad.” We want you to tell us as many problems as you can think of. We want to know every possible improvement that you can think of. Please tell us the problem and then suggest an improvement.”

The questions and answers are provided below.

U1

Q1: Please evaluate this app by rating it on a scale of 1-5 with 5 being the highest and best score.

Answer: I like the design style and I think it is really good. I will give it a 4

Q2: Describe any part of the app that you think could be improved. This includes design features, navigation features, graphical displays, photo and product features. Have you met any problems? What are your suggestions for improvements?

Problems & Suggested Improvements

- Problem: When I added one product into my cart, I did not see any pop-up window to tell me that the product had been added into my cart.
- Improvement: It is necessary to let users know that a product has been added into the cart. It is important to give users some type of signal when they are interacting with the app to demonstrate that a key function is taking place.

- Problem: Because the phone screen is not large, it makes it difficult to see the details of a product. Yet, to make my purchase decision, I want to make sure I see everything about a product. Currently, there is no way to enlarge the size of the product photo.
- Improvement: Allow the user to enlarge the photo with the use of two-fingers-expanding.

U2

Q1: Please evaluate this app by rating it on a scale of 1-5 with 5 being the highest and best score.

Answer: I would say 4.5

Q2: Describe any part of the app that you think could be improved. This includes design features, navigation features, graphical displays, photo and product features. Have you met any problems? What are your suggestions for improvements:

Problems & Suggested Improvements

- Problem: The messaging feature was difficult to find.
- Improvement: Maybe we should put the “message” system into the “account setting” as this would make it more visible.

- Problem: When I am writing a message, I sometimes want to attach a photo to send to a friend. But so far, I am unable to attach a photo to a message.
- Improvement: Add this function to the message system - allowing users to attach photos when they are writing messages.

U3

Q1: Please evaluate this app by rating it on a scale of 1-5 with 5 being the highest and best score.

Answer: I think 4.5

Q2: Describe any part of the app that you think could be improved. This includes design features, navigation features, graphical displays, photo and product features. Have you met any problems? What are your suggestions for improvements?:

Problems & Suggested Improvements

- Problem: I cannot find discounted products easily. It is difficult to locate on the current interface.

- Improvement: I suggest that we offer the user two avenues to find discount. First, the user should be able to find discount by typing in “discount” in search page. But, there should also be an individual page – that is easy to find – with a listing of all current discount products.

- Problem: When I want to search some specific product, I want to narrow my filters, such as search “price between \$10 – \$40”, search product “only with red color”, so far I can not do it.

- Improvement: Add more filters

7. Analyze data and observations

According to the observation and interview with all 3 users, we can see:

U1 is focused on user experience. She expressed that she loves the design style, and the way we present products. She did give several good ideas about the pop-up window (making users aware that they have added products into the cart). She also wants to see more details of the products – ideally, we additional photos of the products.

U2 is comfortable with everything but message system. She did give some good suggestion on message system, for example – let users attach photos when writing messages. But for her other suggestion - putting message into account setting – might not be a good idea. Because user will not able to know they receive messages if they don't open account setting.

U3 is the kind of user who likes to find anything by “exact search”, so he gives good advice on advanced search by using different filters. We think it is a good idea to add more filters, it will make user use feel easy and convenient during their shopping process.

8. Report finding and recommendations

After we finished usability test, we determined that most of the user operations are smooth and intuitive. They appeared easy to navigate and manage during our observations. The users understood the various icons, and did not display any significant problems with the functions. In general, the criticisms that surfaced during the usability test related to the functionality of the interface. Most of the comments related to relatively small design features that would make the purchasing process easier and more intuitive.

- In response to U1's request for enhanced product photos, we could add additional photos of the product from different angles attempting to give the user an almost 360 degree view of each product.

- In response to U2's focus on the message system, we do intend to offer the ability to attach photos. This is a useful feature when communicating among fellow users of the same app.

- In response to U3's concern over discount products, we need to take steps to make sure all users recognize that we have created an entire page dedicated to discount products. We may do this by creating a tab or navigation icon on the home page of the app – making it very clear that a discount page exists.

Chapter 8

User Experience Evaluation

After we finished the demo of Original Source app, we showed “Original Source Website” and “Original Source app” to 10 people. They are not OS costumers, and never know OS before. They are students from University of Oslo. They were requested to find “Terra Cotta Warrior”, and shop it(no need to pay) After they try both, they were been asked questions as below:

Question and analysis:

1) Which looks better? A. OS Web B. OS App

Answer: 7 people choose B, 3 people choose A

3 respondents indicated that the OS app looks better than the OS website. This is due to the more contemporary look and design of the app interfaces. With the app, the focus is on making the products as noticeable and prominent as possible. Much of the interface text that is visible on the website has not been included in the app. The app interfaces are more streamlined – better designed – and your attention is drawn immediately to the products.

2) Which is faster to use? A. Original Source Web B. Original Source App

Answer: 9 people choose B, 1 people choose A

Analysis: Of the respondents, 9 believe that the OS app is faster than the website, while 1 believes the website is faster. The difference in speed can be attributed to the simplicity and directness of the app interfaces. Because of the future workshops and the prototype development, we created interfaces that brought the user to the product page and the discount page very quickly. We created a buying process which could be implemented in just a few clicks. Moreover, we improved the navigation and functionality with the app making it easier to find products.

3) Which one is better for functionality? A. Original Source Web B. Original Source App

Answer: 10 people choose B

Analysis: All 10 respondents believe the OS app has better functionality than the OS website. This finding reflects the better design format of the app. The respondents indicated that the OS app was easier to use – it was easier to find products and it was easier to order products. Importantly, the respondents all appreciated the ability to quickly find discount products on the app. The app functionality was just more intuitive

than the OS website. We think that much of the success of the OS app functionality is the result of our future workshop and prototype. During both of these design processes, we gave users tremendous freedom to describe how they wanted the app to work. We incorporated their suggestions into the interfaces. Importantly, the functionality of the OS app appears to reflect the success of having interface design based on the user's perspective and not the designer's perspective.

(all 10 people choose B)

4) Which is more secure to use? A. Original Source Web B. Original Source App

Please provide the reason.

Answer: 6 people choose A, 4 people choose B)

Analysis: Of our respondents, 6 believe that the OS website is more secure while 4 believe the OS app is more secure. This was not a surprising finding. One of the key factors influencing this belief is that with the OS website, you will be logged off automatically once you close the webpage – thus, making it impossible for anyone to view your personal shopping information. The OS app does not have this feature. You will remain logged-on unless you take deliberate steps to log-off. Logging off is not automatic – unless you turn off the phone. Moreover, we also believe that questions surrounding the security of a smart phone app originate in the natural and constant mobility of a phone. Generally speaking, most people keep the laptop or desktop computer in their home or office. Most shopping on a website is conducted in a secure location – home or office. This creates a perception of security for the user. Whereas with a mobile phone app, the phone is constantly traveling with the user – on a daily basis it is carried outside of the home, it is placed in purses, it is put in pockets etc. The mobile phone app may always be associated with less security due to the mobile nature of the phone itself.

5) How do you think of OS website and OS app

Analysis: The OS website has been effective and profitable for the Company. However, the general feeling among users is that the website is not sophisticated or contemporary enough. Users often feel that the design of the landing page is not attractive or impressive. The Company has a sophisticated giftware line comprised of products from many cultures. However, many users have said that the website fails to convey the right image of the Company. Users have said that the OS website is difficult to navigate – that the product photos require too many clicks to reach – and that many of the functions are not intuitive. In comparison, the impression of the OS app is that it has a more sophisticated. The navigation is more intuitive and obvious. The OS app provides easier search function and a much more obvious discount page.

6) Which one do you prefer? A. Original Source Web B. Original Source App

Please provide the reason why you prefer it?

Answer: 9 people choose B, 1 people choose A

Analysis: Of the respondents, 9 preferred the app and only 1 preferred the website. The overwhelming preference for the app was largely due to the easy and streamlined experience of the app. The app conveys neat, organized and simple interfaces. The product photos are clear and provide more information and description for the products. One respondent did prefer the web – and this was largely due to the fact that he has never felt comfortable shopping by phone. He believes the screen is too small to fully see and appreciate the product photos.

Chapter 9

Discussion

In this chapter, the predesign and design processes are discussed and some reflections on the role of user experience in the design process are made. The focus of the discussion is to determine how user experience can be strengthened in mobile e-commerce application design. To accomplish this, our 3 research questions are answered.

1. Which user-centered design tools & methods are most suitable for development of a mobile e-commerce app?
2. Demonstrate, by making a high fidelity prototype, the use of chosen tools and methods and how users' were engaged in the design process. Reflect on all stages of the design process, including evaluation.
3. What is the user experience with this prototype? Does shopping feel faster, better, easy to use, useful, more secure than using the web or similar apps?

9.1 Research Question 1

Which user-centered design tools & methods are most suitable for development of a mobile e-commerce app?

For the development of the mobile e-commerce app, we utilized multiple user-centered design tools and methods. Though each method had value during the development process, some were clearly more effective than others. The tools that we used included:

1. Case study
2. Questionnaire
3. Future Workshop
4. Perspective Workshop
5. Prototype (low-fi and high-fi)
6. Interview (Semi-structured interview and Structured interview)

Future workshop

It is our conclusion that the future workshop was the most effective and suitable tool. Its value to the design process was substantial and exceeded that of the other tools.

The future workshop has several key characteristics that made it particularly useful for the development of the app. These included the use of three phases that carried the discussion from open & active criticism of the existing website to a fantasy phase which encouraged exploration of many new options. The final phase of implementation then resulted in a visual prototype.

The future workshop provided an environment that embraced key elements of a user-centered design. By establishing an egalitarian and democratic discussion setting, no single person was able to dominate and obstruct the input or ideas of others. It was obvious from the amount of input and ideas in each phase (criticism – fantasy – implementation) that everyone felt empowered through participation. Everyone appeared eager to engage in extensive creative expression. The group participation also helped encourage a sense of being a stake-holder in the process – another key aspect of user-center design. Observing the nature and energy of their suggestions, it was obvious that the participants were eager to create a shopping app that would be easier and more effective. They appeared to have the interest and passion of a true “stakeholder.”

Interview

The interview also played an important role in our design process. An interview can be very hard to conduct if we selected an unsuitable or inappropriate interviewee. However, if one can obtain an interview with someone who can offer a particular point of view, an interview may be a great source of input. In our project, we conducted a semi-structured interview with the ecommerce manager of Original source, whom we call Kitty, and who represents both a user and seller. She is very familiar (more than all other participants involved in the design process) with the problems of the Original Source website. As such, she was able to provide much more comprehensive answers to the questions. Importantly, because she was both an employee and a user, she was able to provide a perspective that was far more unique and extensive than that of just a user. One of the genuine benefits of the interview was Kitty’s revelation and introduction of a major new marketing idea. She introduced the idea of having Original Source offer a “Deal-of-the-Day” strategy whereby a product was offered at a deep discount over a 24 hour period. This type of non-solicited input from the interviewee (we never asked her for marketing ideas) revealed some of the true benefits of an interview for the user-center design process. It is also reinforced the value of selecting a semi-structured format. It appears that this format gave Kitty enough freedom to encourage her self-expression.

Moreover, one of the more obvious benefits of an interview in the design process is the ability to engage a respondent face-to-face. This style of direct communication clearly provides the interviewer with access to far more input than a phone interview or email discussion. Facial features, voice tonality, energy level, eye contact – all combine to provide insight into the interviewee’s true feelings.

Both the future workshop and interview played two very different roles in the design process – but they both shared an ability to truly embrace and illustrate the perspective of the user – making both ideal for user-centered design.

Case study

For research methodologies, there are several effective methods available to use. Action research is a research approach to “solve an immediate problem or a reflective process of progressive problem solving led by individuals working with others in teams or as part of a ‘community of practice’ to improve the way they address issues and solve problems.” (Wikipedia, 2014b). This form of research is more useful for practical problems.

Ethnography requires researchers in the field to do long-term observation and access records. Meanwhile, grounded theory research means that no theoretical assumptions are used. Instead, the research starts directly from real observation, actual experiences and raw data.

All of these research tools are effective, but in consideration of our budget and time limitations, we employed the use of a case study as our research method.

“A case study is an in-depth study of a specific instance within a specific real-life context. Case studies generally use a theoretical framework to guide both the collection of data from multiple sources and the analysis of data. “

For this project, we needed to know how other e-commerce apps in the market work when customers online shopping. We needed to study a small number of participants in order to gather requirements and evaluate interfaces.

We choose 2 existing ecommerce app, and conducted a usability test with one couple (man and woman). We selected Victoria Secrets and Amazon as the two apps for use in the case study. We gathered data by observation and the use of a structured interview. During the usability test, the difficulties of using a phone app were very evident. Most of the difficulties were associated with poor and inappropriate interface design. For example, the man often became lost or temporarily “stuck” during the shopping task. It was challenging for him to find the shopping cart. He also indicated that the hardest part was “sorting and filtering” and indicated that he wanted a better way to categorize and narrow down his choices by price and ratings.

While the future workshop, interview and case study were the most effective tools to support our user-centered design activity, other tools were also employed with varying levels of effectiveness. Though each had benefits, they also had shortcomings, which are identified here.

9.2 Research Question 2

Demonstrate, by making a high fidelity prototype, the use of chosen tools and methods and how users' were engaged in the design process. Reflect on all stages of the design process, including evaluation.

Perspective workshop

To prepare our high fidelity prototype, we decided to use a perspective workshop. This type of workshop is particularly useful when you are looking to generate a high number of solutions and ideas. We really wanted our participants to offer as many suggestions as possible, and we needed a good format to capture these ideas and present them all in a visible list format.

One of the key elements of the perspective workshop is that it allows us to benefit from the unique experience of each participant. In our case, we were looking to improve the interface design. And, the perspective workshop has the ability to shift the focus of interface design away from the designer and into the hands of the user. Each participant is treated equally and each participant is strongly encouraged to participate.

Moreover, a perspective workshop provided an outlet to capture the personality and experience of each participant. This was important for us because our participants were quite diverse in their background.

One of the challenges of a perspective workshop is that it begins with a focus on individual activity. Individuals first list their own ideas on small post-it notes. There is no group interaction at this stage. This is effective for individual brainstorming. However, the challenge then comes later when a consensus has to be reached. A key element of the perspective workshop is that a consensus of ideas needs to be reached at the end.

Questionnaire

We concluded that the questionnaire was not be as effective as the future workshop. One key problem with the questionnaire is the influence and impact of the actual question. If the questions are effective – then, the resulting information will be revealing. But, if the questions are not designed well – it can result in poor information.

We observed weaknesses in certain questions. For example – with Question 16 we asked the participants to rate their level of interest in various functions found on the Original

Source shopping app. We provided 5 functions, and with ratings of 1- 5 to reflect their extent of interest. It turned out that it is hard to analyze the data we gathered. Interest is a hard emotion to measure in terms of usability – especially with technology. In reflecting on this, we now think it would have been much better to have the participants sort the 5 functions by the extent of importance. The *level of importance* of a particular function in using an app is a far more intuitive feeling than trying to measure the *level of interest*. As such, the feedback and data collected for Question 16 did not have the value we had hoped for. In order to address this, we provided the possibility for participants to discuss importance of functions during the future workshop. The information gathered from the future workshop was much more valuable than the data from questionnaire.

Moreover, the very nature of a question can limit the scope of an answer. We did make an effort to use open-ended questions. For example – in Question 12, when asked how easy it was to use the Original Source app, 26 of the respondents reported some type of problem. Then, to explore this further, in Question 13, we asked them to describe the problem. This is where we encountered a disappointing response rate. Only 3 of the 26 individuals reporting a problem took the time to actually write a description of the problem. Why did the others not respond? We speculate that most simply did not have enough interest or energy to take the time to write. In other words, they were “lazy.” The key observation is that while an open-ended question has value in its ability to encourage free expression – its effectiveness directly depends on the energy and willingness of the respondents. A great question can be made useless if you give the responder an easy opportunity to ignore it – which is what happened in Question 13. Instead of a broad and comprehensive answer, we received a much narrower response.



Figure 23: Part of Questionnaire Summary

Prototype

While a paper prototype is a good way to translate a design from an abstract concept to a more concrete item, it does have limitations. In this project, we made 6 pages of low-fi prototype, and then improved it into high-fi prototype through a perspective workshop. Leading up to the low-fi prototype, the participants in the future workshop engaged in extensive brainstorming – often introducing “crazy ideas” on how to design the app. Many of these ideas had value. But, there are some boundaries with a low-fi prototype that served to limit the creativity and discussion. For example, with a real app, there are more than 20 pages. But, the 5 users do not indicate a desire or willingness to draw all the necessary pages – establishing a clear limitation. This limitation resulting is us spending a majority of time only focusing on the 6 main pages (Home page, search page, login page, product page, cart page and my account page). Other pages did not receive enough attention.

Others

The User-centered Design process led to key conclusions. Several of the conclusions serve to reinforce the effective of our design process. But, other conclusions also serve to provide us with our “to-do” list for future work. Key conclusions include:

Functional Design – The usability test revealed basic weaknesses and challenges in our functional design. Key processes and features need improvement – need to be made more intuitive, clear and streamlined. We need to create our own blueprint to upgrade the navigational features. While the suggestions of the workshop are helpful, we cannot be in a position where we are always reacting. We need to have our own plan in place with our desired design features already described and set. Basic issues such as page jumping and smooth switching from feature to feature must be improved.

Focus on Products – One of the recurring themes by many users was the need to improve product presentation. This makes sense. In retail, the saying is “packaging is everything.” We look upon the interface and product photo as if it is the “gift package” for the product. An effective interface and product photo now serve as the modern-day gift package in retail. As such, it is a vital part of the E-commerce shopping experience. Multiple users requested that we improve our product photos and description.

Properties of Computer Gaming – One of the findings of our design process was the connection between computer games and the mobile shopping app. As a result of the relatively young base of users, most of them had played computer games and several of them believed that characteristics of those games could be successfully transferred to a mobile app. In particular, we heard our users describe a point system based on

purchasing and visits – whereby you accumulate points (like a game) and use those for buying product.

Importance of Discounts – Another key conclusion was the importance of discounted products. The issue was not just the discount but rather the need to make discounted products more visible and prominent. The result was the creation of a separate Discount page.

Role of User-centered Design – Throughout the pre-design and design process, it became very clear that the methodology of HCI is an ideal tool to create a mobile shopping app. Its ability to encourage active, equal and democratic participation – without influence from “industry experts” – was a key part in building a quality demo. It provides the theoretical and practical steps to objectively analyze and improve a technical process.

The Summary of the Predesign and Design process is shown as below:

| | Design Method | Participants | Content | Result |
|--------------------------|----------------------|---------------------|--|--|
| Predesign Process | Case study | 2 | Test Amazon and Victorial secret | Get basic understanding of other app |
| | Questionnaire | 30 | Fill in a questionnaire with 17 questions | Get basic understanding of Original Source customers |
| Design Process | Future workshop | 5 | Criticize Original Source website, Fantasy better website solution, Draw Original Source app paper prototype | Gather data and make a low-fi prototype |
| | Workshop | 5 | Give suggestion of low-fi prototype, draw a better app paper app | Gather data and make a hig-fi prototype |
| | Semi-interview | 1 | Give suggestion of High-fi prototype | Gather data and make a demo |
| | Usability test | 3 | Test demo respectively | Gather data and make the final app |

Table 5: Summary of the Predesign and Design process

9.3 Research Question 3

What is the user experience with this prototype? Does shopping feel faster, better, easy to use, useful, more secure than using the web or similar apps?

After we finished the demo of Original Source app, we showed “Original Source Website” and “Original Source app” to 10 people and conduct a user experience testing.

Overall, we conclude that 90% of the users prefer to use the app over the website. The primary reasons for this preference are that they believe the app is faster, more attractive in appearance and better functionality. However, in terms of security, the clear preference is the web. 60% of the users believe the web offers more security due to concerns over the phone being lost while the user is still logged on.

It can be seen that shopping with the Original Source app is faster, better and easier. The Original Source app has better functionality and easier to navigate. However, there are still concerns and a belief that the app is not as secure as the Original Source website.

9.4 Summary

We found that majority users who are participating in online shopping are young professional people, they are very comfort with the use of smartphones to handle daily affairs, including shopping. And They know what they want during the shopping process on mobile phone, they also have a clear understanding of the interface of the app. More over, they are full of creativity. The design of the app is not just a simple copy of website, with the users’ effort, we improve the user experience of the website and have many innovation on the phone.

Chapter 10

Conclusion and Future Work

10.1 Conclusion

The use of mobile shopping apps continues to grow and reflects the willingness and tendency of customers to utilize any fragment of time to purchase a product or service. The growing popularity of mobile phone apps coincides with the growing 24 hour connection and dependence we have with our smart phones. Customers, specifically those between 15 and 40 years old, are clearly comfortable using a hand-held device to make significant purchases.

In this Thesis, we examined how to use the principles and methodology of User-centered Design to design and develop a mobile shopping app. The development of the mobile shopping app was in support of a traditional wholesaler named: Original Source. Original Source is seeking to grow sales of its products and determined that the best avenue was to expand beyond wholesale and sell directly to the public. But, to support this strategic move, a new tool was required to help facilitate more frequent, more effective and more interactive contact with the public. A mobile shopping app is a tool that can offer Original Source a direct channel to build retail sales. The key focuses of this Thesis was to explore how HCI design practices could result in the creation of an effective shopping app with positive user experience.

The method used to create the mobile shopping app was divided into a pre-design phase and a design phase. Each served a distinctive purpose. The pre-design phase gave us insight into existing apps through a case study. Through the evaluation of two very popular and successful current retail apps, it was clear that there was room for improvement. Key concerns communicated to us by two participants tended to focus on filtering, product search and navigation. The subsequent questionnaire then provided us with a body of data to help us gain a better understanding of the current users of Original Source. It was clear from that survey that we were working with a younger demographic of users who were comfortable with mobile apps and eager to expand their usage. The majority of our users were young professionals who rely on their smartphones to handle multiple daily tasks to include shopping. The questionnaire also revealed key insights into the Original Source customer base. We could see patterns of shopping behavior in terms of visit frequency and dollars spent. We were able to determine a measure of customer loyalty through a higher number of visits than previously expected. We were able determine trends in terms of product preferences. There were categories of products

that generated greater response than others. All of this data is influential in the future design of the OS mobile app. The pre-design phase provided a basis of understanding and a body of data that then enabled us to commence the actual design phase.

The focus of the design phase was the use of workshops for the development of a low and high fidelity prototype. Workshops are a vital tool of User-centered Design and we utilized both a Future Workshop and a Perspective Workshop. Each served a unique purpose with both workshops allowing us to engage in the process of refinement. From the wide and extreme suggestions heard during the brainstorming and fantasy stages of the Future Workshop, we moved into the more focused and specific design features of the Perspective Workshop. The workshop stages served as iterations in the design process.

The workshops also revealed the impact of user personality on an User-centered Design development process. We had participants who were active mobile app users as well as individuals who had no experience in mobile app purchasing. What was generally confirmed is that younger customers are very comfortable with using mobile apps. As a whole, a reluctance to engage and use technology was not a challenge encountered in this HCI design. The challenges were instead related to actual improvements to the interface and in the need to gain consensus among the users.

We found our participants to be creative and open-minded. In each workshop, they demonstrated an eagerness to contribute suggestions. Regardless of technical skill, it was apparent that most users assume a sense of “expertise” when recommending design changes. We can only conclude that the nature of personal shopping is so important to users that they are very comfortable assuming a role as a natural stakeholder in the process. The focus of the workshops was the creation of a democratic environment that encouraged group participation and a respect of all ideas and opinions. In each setting, we were careful to eliminate symbols of authority and expertise. An egalitarian atmosphere was established to encourage everyone to voice their ideas. The results were effective prototypes that were much more than a simple copy of the current website. We were able to identify and incorporate key new innovations with the mobile app.

The semi-interview was an important step for our design process. The interviewee provided key insights. The decision to use a semi-structured interview was based on our interest in providing initial questions which would then lead to new territory. With our interviewee, we were in a position where she possessed greater knowledge of both the Original Source website and of the industry in general. She was in fact, teaching us. As such, we wanted to limit our structure to just a few key areas giving her plenty of flexibility to share all of her insights. Importantly, with our interviewee we benefitted from an enhanced perspective. She was both a young professional who routinely used

mobile apps to buy products and she was an executive at Original Source who was responsible for building sales. With her, we had a perspective from someone who was both a frequent buyer and a professional seller. This definitely provided added value to her suggestions for our high fidelity prototype.

At the conclusion of the workshop phase and upon completion of the prototypes, we conducted a usability test to evaluate the actual workability of the prototype app. The process of observing the different users provided a clear understanding of both weaknesses and strengths of our design.

10.2 Future Work

The current mobile app system function is not fully implemented. The demo is designed but further investment in time and resources is required to complete. Additional testing and modification are required.

For future work, we have identified several key steps to include:

- a. Continue to finish the payment function, so that a user can access visa, master, PayPal.
- b. Improve the Fast Tracking System – connecting it to the UPS Web site.
- c. As our participants suggested, improved the reward system that includes both points and coupons. The idea is to create more motivation for additional visits and use.
- d. Recognize that one of the key advantages of a E-commerce is the extent and ease of seller and buyer interaction. A mobile app provides an effective tool for users to provide immediate product feedback in the form of online ratings. As such, for future work, we will make the rating system more effective and easier to use.
- e. There are several design details about the interface that need to be reconsidered, for example, how to make animated transitions smoother, more beautiful.
- f. Ultimately, the goal is to finish the entire application and launch it in an app store.

Mobile online shopping provides a business with a great tool for reaching more customers and building sales. A mobile app represents a key stage in the ongoing development of E-commerce. The popularity of a mobile app coincides with the tremendous growth and reliance on smart phones. In today's E-commerce marketplace,

the ease and simplicity of how a customer navigates across a screen is a direct source of competitive advantage. In the past, a retailer's competitive advantage originated in the shelf location – where was the product placed inside of a brick store, or the retailer may have gained a competitive advantage with nice packaging such as a gift box. But today, competitive advantages in retail relate directly to smooth and intuitive screen designs that allow a customer to see a product clearly and make an easy online purchase transaction.

This Thesis has used HCI research and design methods to create an app demo. We hope that Original Source can use this app to expand sales in the retail market segment. This approach has revealed to us the ability of the convenience, effectiveness an overall appeal of a shopping app can attract and retain more customers.

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Appendix

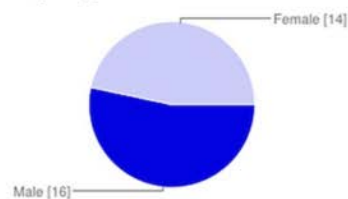
Appendix 1: The summary of the use of Questionnaire of Original Source.com

30 responses

[View all responses](#) [Publish analytics](#)

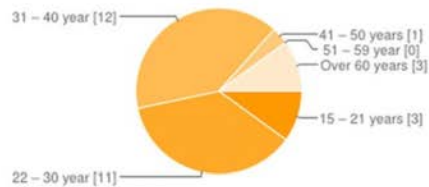
Summary

1.What is your gender?



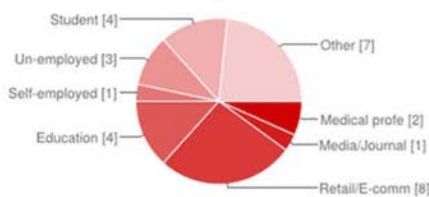
| | | |
|--------|----|-----|
| Male | 16 | 53% |
| Female | 14 | 47% |

2.How old are you?



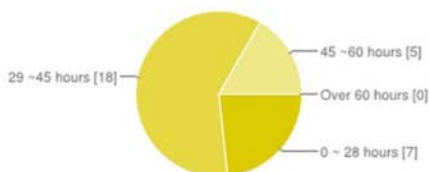
| | | |
|-------------------|----|-----|
| 15 – 21 years old | 3 | 10% |
| 22 – 30 years old | 11 | 37% |
| 31 – 40 years old | 12 | 40% |
| 41 – 50 years old | 1 | 3% |
| 51 – 59 years old | 0 | 0% |
| Over 60 years old | 3 | 10% |

3. What kind of work do you do?



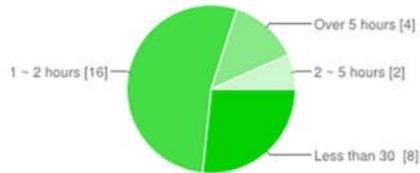
| | | |
|----------------------|---|-----|
| Medical professional | 2 | 7% |
| Media/Journalism | 1 | 3% |
| Retail/E-commerce | 8 | 27% |
| Education | 4 | 13% |
| Self-employed | 1 | 3% |
| Un-employed | 3 | 10% |
| Student | 4 | 13% |
| Other | 7 | 23% |

4. How many hours do you work a week?



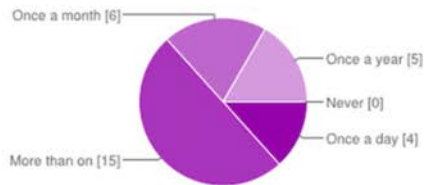
| | | |
|---------------|----|-----|
| 0 ~ 28 hours | 7 | 23% |
| 29 ~45 hours | 18 | 60% |
| 45 ~60 hours | 5 | 17% |
| Over 60 hours | 0 | 0% |

5. How many hours a day do you spend on your phone?



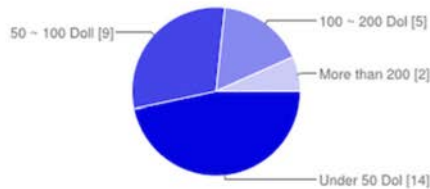
| | | |
|------------------|----|-----|
| Less than 30 min | 8 | 27% |
| 1 ~ 2 hours | 16 | 53% |
| Over 5 hours | 4 | 13% |
| 2 ~ 5 hours | 2 | 7% |

6. How often do you shop online?



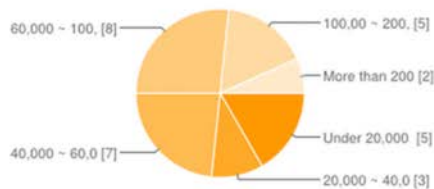
| | | |
|-----------------------|----|-----|
| Once a day | 4 | 13% |
| More than once a week | 15 | 50% |
| Once a month | 6 | 20% |
| Once a year | 5 | 17% |
| Never | 0 | 0% |

7. On average, each time you shop online, how much money do you spend?



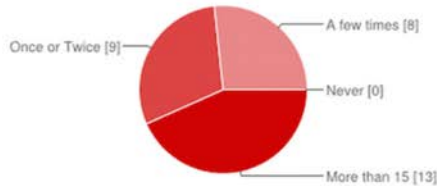
| | | |
|-----------------------|----|-----|
| Under 50 Dollars | 14 | 47% |
| 50 ~ 100 Dollars | 9 | 30% |
| 100 ~ 200 Dollars | 5 | 17% |
| More than 200 Dollars | 2 | 7% |

8. How much money do you earn a year? * *



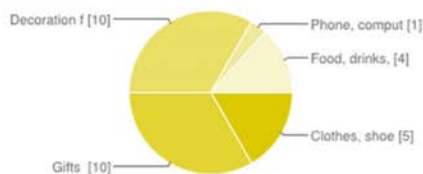
| | | |
|---------------------------|---|-----|
| Under 20,000 Dollars | 5 | 17% |
| 20,000 ~ 40,000 Dollars | 3 | 10% |
| 40,000 ~ 60,000 Dollars | 7 | 23% |
| 60,000 ~ 100,000 Dollars | 8 | 27% |
| 100,000 ~ 200,000 Dollars | 5 | 17% |
| More than 200,000 Dollars | 2 | 7% |

9. How many times have you visited OriginalSource.com?



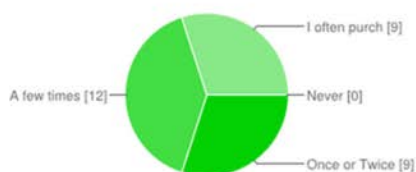
| | | |
|--------------------|----|-----|
| More than 15 times | 13 | 43% |
| Once or Twice | 9 | 30% |
| A few times | 8 | 27% |
| Never | 0 | 0% |

10. What kind of product you usually shopping online?



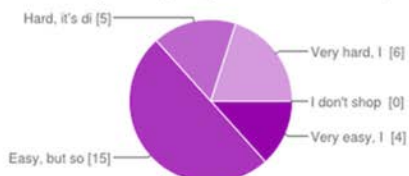
| | | |
|-------------------------------------|----|-----|
| Clothes, shoes, make-ups, clearance | 5 | 17% |
| Gifts | 10 | 33% |
| Decoration for home | 10 | 33% |
| Phone, computer accessories | 1 | 3% |
| Food, drinks, snacks | 4 | 13% |

11. Have you ever bought products from OriginalSource.com?



| | | |
|--|----|-----|
| Once or Twice | 9 | 30% |
| A few times | 12 | 40% |
| I often purchase products from Original Source | 9 | 30% |
| Never | 0 | 0% |

12. How do you easy do you think it is to shop on OriginalSource.com?



| | | |
|---|----|-----|
| Very easy, I always get what I need. | 4 | 13% |
| Easy, but sometimes I encounter a few problems. | 15 | 50% |
| Hard, it's difficult to find what I need. | 5 | 17% |
| Very hard, I always encounter problems. | 6 | 20% |
| I don't shop on OriginalSource.com | 0 | 0% |

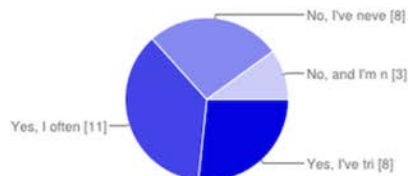
13. If you have encountered problems using OriginalSource.com, please describe them.

need more pictures of the product

Can not find the product I want

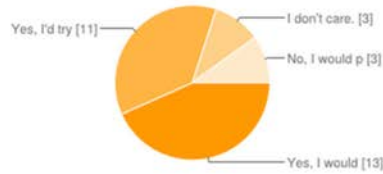
can not find the description of the product

14. Have you ever, would you ever, use your phone for online shopping?



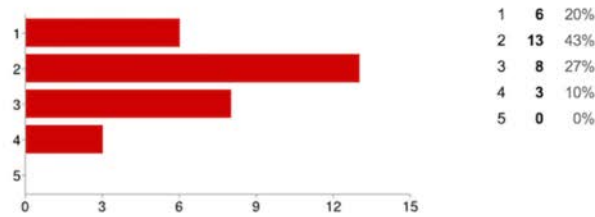
| | | |
|---|----|-----|
| Yes, I've tried it. | 8 | 27% |
| Yes, I often use my phone to shop online. | 11 | 37% |
| No, I've never tried but I am interested. | 8 | 27% |
| No, and I'm not interested. | 3 | 10% |

15. Would you prefer to use a mobile phone application to shop online at OriginalSource.com?

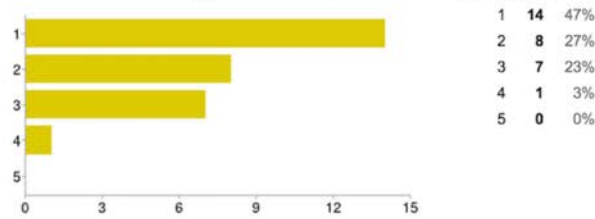


| | | |
|------------------------------------|----|-----|
| Yes, I would! | 13 | 43% |
| Yes, I'd try it at least. | 11 | 37% |
| I don't care. | 3 | 10% |
| No, I would prefer to shop online. | 3 | 10% |

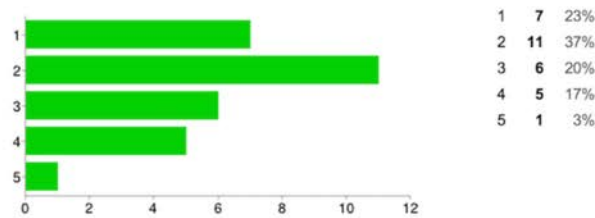
Shopping history [16. For an Original Source shopping app, rate your level of interest in the following functions]



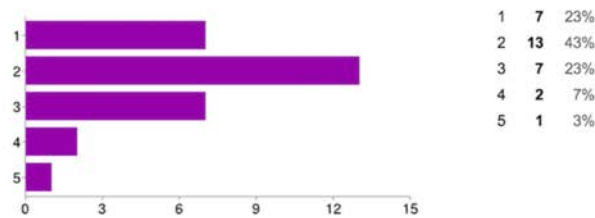
Product order tracking [16. For an Original Source shopping app, rate your level of interest in the following functions]



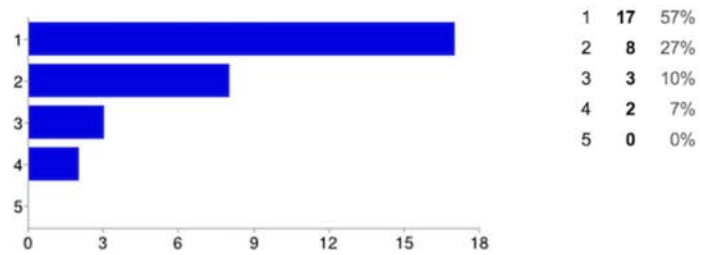
Product recommendations [16. For an Original Source shopping app, rate your level of interest in the following functions]



Discounts galore! [16. For an Original Source shopping app, rate your level of interest in the following functions]



Rating products [16. For an Original Source shopping app, rate your level of interest in the following functions]



17. Please feel free to make any app suggestions!

hopefully shopping on the phone is cheaper than website

Hope to see comments on products